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COLD LAKE REGIONAL BASELINE STUDY PHASE II

Pre Impact Baseline Survey

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COLD LAKE BASELINE STUDY: PHASE II

GENERAL POPULATION

Pre-Impact Study

Report II

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Project conducted by Thames Group Research and The
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1. INTRODUCTION

1.1 Study Objectives

Esso Resources Ltd. has proposed to construct and operate a commercial bitumen extraction and upgrading facility in the Cold Lake area. The present study was commissioned by the Government of Alberta to establish a socio-economic baseline against which to assess changes that may result from that development. The research was to collect comprehensive information by interviewing a representative sample of residents in the study area (Figure 1.1). A series of reports based on extensive field work describe the social and economic characteristics of the area where the most immediate effects of development are likely to occur.

Results covered in the present report document the analysis of a social survey conducted in October and November of 1979. Its primary concern is to provide a pre-impact report on the social characteristics of the three towns in the study area (Bonnyville, Grand Centre, and Cold Lake), the three villages of Glendon, Fort Kent, and Ardmore, and the rural areas surrounding these centres. Separate reports cover the results of comparable surveys of residents of the Canadian Forces Base (Medley), Cold Lake (Report III), and the two Metis communities of Elizabeth and Fishing Lake (Report IV). The latter special population report also includes a brief review of available data

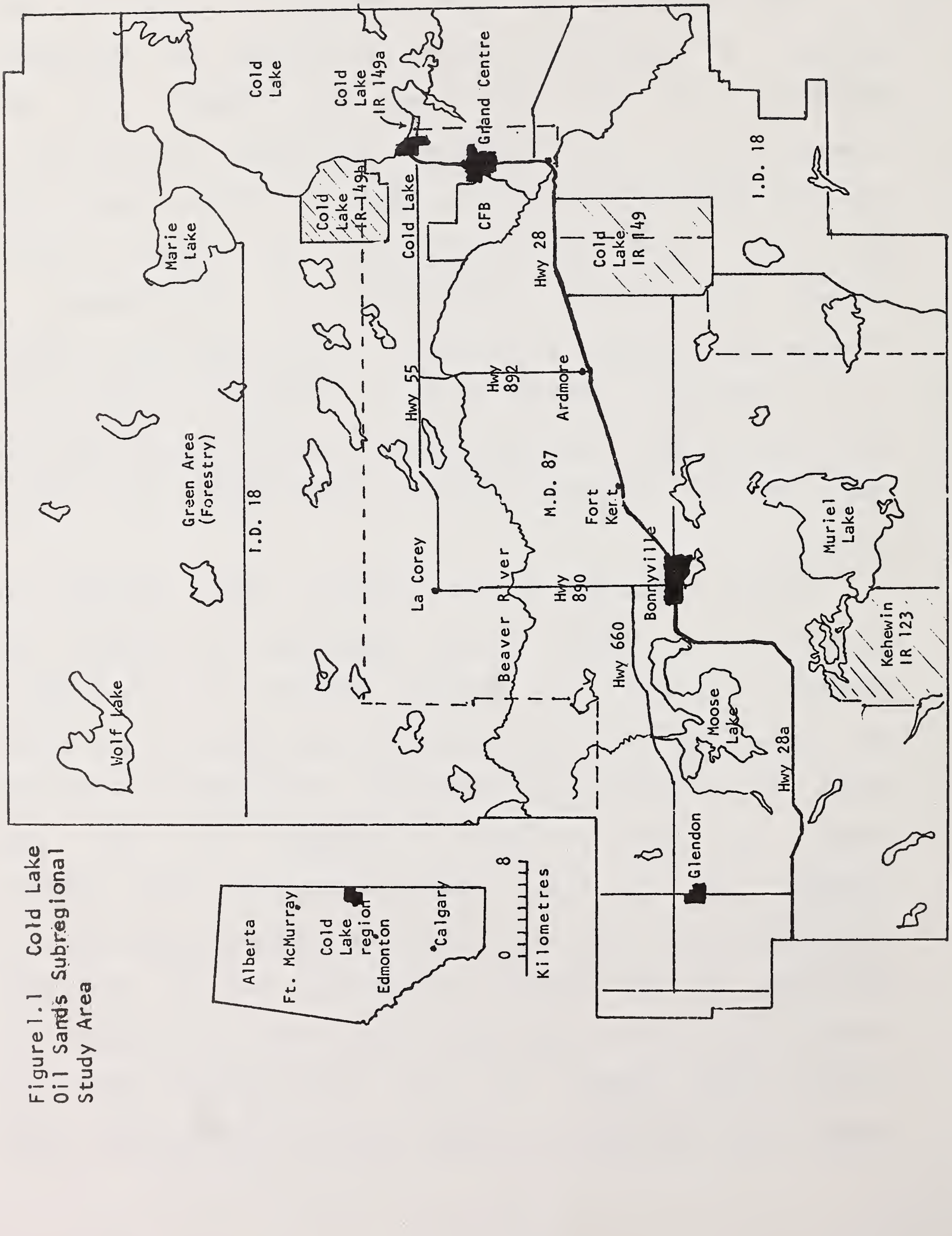


Figure 1.1 Cold Lake Oil Sands Subregional Study Area

concerning the Cold Lake and Kehewin Indian Reserves. A detailed description of the research methods used in collecting the data and proposals for future research are contained in Report VI. Results of an inventory of commercial establishments and a description and analysis of business activity in the study area are contained in Report V by Peat, Marwick and Partners.

1.2 The Study Area

The boundary for the Cold Lake Regional Socio-economic Baseline Study is identical to the sub-regional study conducted by Alberta Municipal Affairs (Alberta Municipal Affairs, 1978). As illustrated in Figure 1.1, the area covers all of the Municipal District of Bonnyville plus the area north of the M.D. to the boundaries of the Primrose Lake Weapons Range. This additional area extends 18 miles north of the M.D. boundary, and west to slightly beyond Wolf Lake.

The town of Cold Lake is about 292 km. (by Highway) northeast of Edmonton. Grand Centre is about 5 km. to the south of Cold Lake, and Bonnyville is about 48 km. closer to Edmonton. In 1911 the area had a population of 911 (Alberta Municipal Affairs, 1978). Most of the settlement in the early 1900's was agricultural with Bonnyville as the regional service centre. The population of the area continued to increase through the 1920's (2,723 in 1921) and 1930's (6,466 in 1931 and 9,861 in 1941) based principally on agriculture. After World War II the population increased rapidly with the establishment of Canadian Forces Base Cold Lake near the hamlet of Grand Centre. By 1956 the population had increased from 9,069 (1951) to 14,031. It continued to increase to 16,913 in 1961, 18,748 in 1966, 19,656 in 1971, and 20,118 in 1976. The rate of increase slowed over time. In 1976 the urban population of the area (including Glendon) was 7,293 with a rural population of 7,293 (1,050 on reserves and slightly over 400 in hamlets). In addition, CFB Cold Lake had a population of 5,434.

Over the period 1961 to 1976 Bonnyville's rate of growth decreased from 5.8% between 1961 and 1966 to 2.2% between 1971 and 1976. Cold Lake's population remained relatively constant after initially rapid growth connected with the establishment of CFB Cold Lake. Grand Centre had a similar large initial increase, but continued to grow more and more rapidly throughout the late 1960's and early 1970's. The overall slowing in the rate of growth for the region reflected the decreasing population of the rural area. In 1976 Bonnyville had a population of 2,873, Grand Centre had a population of 2,751, Cold Lake had a population of 1,303, and Glendon had a population of 366.

The major lakes in the area are Cold, Marie, Wolf, Muriel, and Moose. With nine other smaller lakes they made the area important for its water-based recreation. The major river in the area, the Beaver, cuts across the middle of the region from west to east. The area is a gently undulating till plain of nearly featureless ground moraine. Vegetation is mixed wood with aspen and balsam poplar the most common trees. The area has warm summers and long cold winters with an overall mean annual temperature of 0-1.5° C. July temperatures see highs of between 15.5 and 16.5° C. and there are about 90 frost free days in a growing season about 154 to 165 days long (April 25 to Oct. 6). Average annual precipitation is about 380 to 430 mm. with about 320 as rain mostly in May through July (Alberta Municipal Affairs, 1978).

1.3 The Proposed Esso Resources Development

Esso Resources' Cold Lake Project involves the in-situ recovery of bitumen (heavy oil) and its upgrading into synthetic light crude oil (Resource Management Consultants, 1978). The development and testing of the project has been underway since 1964 with about $40 million spent on research by 1976.

The proposed scheme will be located in the Clearwater formation in the Cold Lake Oil Sands deposit on a lease just west of Cold Lake. The site is about 25 km. north west of Cold Lake and Grand Centre, and about 50 km. north and slightly east of Bonnyville (Figure 1.1). Construction was scheduled to begin in later 1980 with production planned for 1985.

The development area (143 sq. km.) is estimated to contain something more than 7 billion barrels of bitumen.

Given present technology, about 20%, or approximately 1.5 billion barrels of bitumen will be recovered by the project. The in-situ recovery process involves reducing the viscosity of the bitumen by the injection of steam. Wells will be grouped in satellite clusters of 20 wells each (about 1.6 ha. per well). Wells are drilled to angle out from a vertical centre well, with about 1400 wells drilled initially and 320 added each year to offset productivity declines. The gas, water and bitumen will be gathered to a central production plant where they will be separated. The primary upgrading of the bitumen by a flexicoking process is followed by secondary treatment which adds hydrogen and removes nitrogen and sulphur.

The facility will produce about about 141,000 barrels of light crude oil per day which will be transported by pipeline to Edmonton. The process requires 584,000 barrels/day of fresh water and for every unit of energy consumed, 2.2 units of energy are produced for the market. The total cost of construction is estimated at $2.5 billion (1977) with actual outlays about $4 billion. Construction will employ as many as 10,000 workers (1983-1984) with total direct and indirect employment of over 15,000 in 1984. Operating employment will peak at about 2,000 in 1985 and fall to about 1,500 by 1990. The operating expenses for the plant will be about $300 million per year and the population of the region will be increased by about 20,000 at the peak of construction in 1984 (Resource Management Consultants, 1978).

1.4 The Purpose of a Baseline Study

The primary objective of the 1979 survey of the Cold Lake region was to provide an understanding of the existing social and economic systems of the area before the impact of industrialization. Such information is necessary for the development of empirically grounded development policy. The 1979 survey is conceived as the first in a longitudinal study designed to assess the impact of Esso Resources' Cold Lake Project. As a pre-impact survey, it is intended to establish existing baselines and trends against which to compare future changes in the study area. Further data collection efforts (Cf. Report VI) will be designed to study changes that have occurred, as well as the process by which those changes were produced. Only in this manner can we begin to sort out the effects of the construction and operation of Esso Resources' project from other developments that might have occurred without the presence of the new plant.

As Bowles (1979:10) has pointed out, this baseline study, like any other social impact assessment, assumes that:

1. There is a defined community, or, in this case, several communities, with more-or-less stable patterns of social behaviour;
2. An identifiable intervention, here the construction of a

resource project, will take place;

3. This intervention has consequences which produce changes in the pattern of activities and social relationships within the study area;
4. these changes are different from or in addition to those which would have occurred as a consequence of processes already operating in the region.

Without a thorough empirical assessment of the pre-impact status of the study area it would be practically impossible to reliably differentiate intervention impact from other developments

Pre-impact measurements and longitudinal study designs are critical to social impact assessment. Despite this, and despite the importance of resource development in Canada's history (Lucas, 1971), studies which "rigorously analyse the impact of development on hinterland communities through all signficant phases seem to be few indeed" (Ritchie, 1978:70). Many reports do not get beyond a dreary repetition of cliches, anecdotal opinions, informed guesswork, and only vaguely relevant available (census) material.

Many authors extol the desirability of social impact assessment (Hodge, 1975; Boothroyd, 1975; Bowles, 1979), consultation (Gibson, 1976; Noble, 1976), and bottom-up versus top-down planning (Matthews, 1976; Jacobs, 1978). Others note the inadequacies of transplanting urban modes of development to rural settings (Lotz, 1977; Paine, 1977; Poetsche, 1972; Van Ginkel, 1976; Matthews, 1977). But as reviewers have repeatedly noted (Riffel, 1975; Himelfarb, 1976; Summers et al., 1976; Bowles, 1979; Larson, 1979), previous efforts at systematic field work have usually relied on available data (Buse,1978) or reported results from single survey, post-impact field research (Jackson and Poushinsky, 1971; Matthiasson, 1970;1971;MacMillan et al., 1974;Nickels et al., 1976; Porteous,1976;Van Dyke and Loberg,1978;Gartrell et al., 1980). None of these studies were able to implement pre-impact surveys.

Even the research upon which the present investigation builds (Summers et al., 1974) did not include a pre-impact survey. While it was an in-depth, longitudinal study of the impact of a large steel mill on Hennepin County, Illinois, the researchers did not begin primary data collection until after the plant was in operation. Pre-impact analysis relied upon secondary data (Summers et al., 1969). The social impact survey of Fort McMurray undertaken by the authors of this report (Gartrell et al., 1980) was also essentially a post-impact assessment. The survey reported here is therefore the first step in a relatively unique program of research that will result in significant improvements in social impact assessment.

1.5 Indicators of Social Impact

How do we choose among the many indicators of social change that may be relevant to future adjustments of individuals and families? It is not enough to develop contingency trees to identify possible first, second, and higher order impacts (Finsterbusch and Wolf, 1977:6). While such constructs do help to orient thinking about impacts, both their complexity and the open ended nature of many of their categories render them inappropriate as tools for analysis. It is all too easy to create an unmanageably long list of questions to ask (Larson,1979;Berger, 1978).

The location of large industrial plants in rural settings near small towns can bring sudden, rather traumatic changes in the communities involved (Summers et al., 1976). Some change follows inevitably from massive capital investment, new employment oppportunities, in-migration, population growth, and increasing demands for services. How can we provide a parsimonious summary of the factors which are likely to be affected most? What are the most useful indicators of social and economic change?

Questions used in this study focus upon material gain and improvements in the quality of life (Campbell et al., 1976;Olson and Merwin,1977;Finsterbusch and Wolf, 1977). Status attainment (Blau and Duncan,1967) and the quality of life are seen as outputs of the process by which individuals, families and communities adjust to the impact of change (Gartrell et al., 1980). More specifically, these outputs include:

1. Indicators of the demographic basis of the study area;
2. Variables describing the material well-being (income, housing,services etc.) of individuals and families in

the region;

3. Dimensions of social relational well-being and social support networks (family, friends, neighbours and voluntary associations);
4. Various attitudes towards the community and the perceived impact of change;
5. Dimensions of individual subjective wellbeing (feelings, alienation etc.).

1.5.1 Demographic Factors

These indicators describe population growth and changes in the social and economic composition of the population. Of particular interest are such characteristics as marital status, and age and sex structure as they bear upon dependency ratios (the ratio of young and old to the working age population). These factors influence service demand, since people at different points in the life cycle use different kinds of services. Other indicator areas of interest include labour force characteristics (participation rates), housing, and migration. The latter is of particular importance as it reflects community stability.

In reconstructing the demographic baseline for the study area we examine change from 1961 through 1976 using census materials. Where applicable, this information will be updated in later chapters by the results of the 1979 survey. Altogether, this is intended to yield a description of trends before the impact of new industrial development. Having established this dynamic baseline, future results can identify alterations in these patterns which may be linked to resource development.

1.5.2 Indicators of Material Well-Being

This section includes a detailed examination of incomes, consumption, housing, debt, and services (including leisure and recreation). Pre-impact patterns of income distribution, consumption and debt will be examined in order to later judge whether residents of the region have benefited from the employment and business opportunities offered by new industrial development.

Some development has already occurred in the area, both in connection with CFB Cold Lake (addressed in Report III), and in connection with the establishment of pilot plants. In addition, there may have been some changes because of anticipation of future large-scale developments. Pre-impact differences across synthetic migration cohorts will be examined to see whether more recent arrivals enjoy better opportunities and higher incomes than do long-term residents.

It is also important to establish a baseline for the degree to which present differences in material well-being within the area are a function of differences in experience and education (or other "ascribed statuses" such as sex). Also, to what degree do income differences account for differences in non-mortgage debt? Incomes from farming are analyzed separately in the "incomes" chapter along with several other topics related to farming. Special attention is paid to social groups such as the elderly who may have relatively low incomes.

Housing is given special attention because it is an important consumption item that has a profound effect on the quality of life. The high cost of housing is currently a problem throughout much of Alberta, and housing appears to be a perennial problem in resource towns (Riffel, 1975; Larson,1979;Gartrell et al., 1980). This pre-impact assessment examines the current situation before development begins and creates increased demand for housing. There may be existant problems perceived by some groups (new residents, young families, low income groups) or residents of some areas. These must be clearly identified in order to later evaluate the impact of development.

Without prior planning and ameliorative measures, rapid growth may produce both lags in housing supply and lags in the development of service delivery systems (re protection, health, communication and transportation, schools etc.). Such problems are made all the more difficult by changes in demand that arise from changes in population composition. Our first efforts are therefore directed towards establishing a pre-impact demographic profile of service use in the different communities in the study area. Then we turn to residents' evaluations of services. Where applicable, we compare the evaluations of those who report using the service with evaluations of those who have not used them.

Differences in evaluations by residents who have lived in the communities for different lengths of time are also important.

1.5.3 Social Relations

These indicators focus on social participation and social support. Family life, interaction with kin, friends, and neighbours all reflect informal social networks (primary social ties) necessary for both everyday life and adjustment to change. Participation in community voluntary associations indicates the degree of integration of respondents within more formal community networks. Such associations often provide valuable social support within the community.

One of the problems with rapid growth communities is reputed to be a lack of social participation produced by high turnover and community instability. In assessing the network connections of residents of the study area, comparisons to other communities (Edmonton, Fort McMurray) are crucial to an understanding of pre-impact conditions. Without such comparisons, it is difficult to know whether observed patterns of social interaction are relatively strong or weak.

As was the case for material well-being, we will also examine the extent to which there are barriers to participation. Even if network connections are relatively strong in all communities within the study area, we may find that certain social groups (the young, housewives, the poor) have relatively poor access to some systems of social support. The final link in this theory is the connection between relatively low participation, weak social support networks and social, family and personal problems. This is pursued in a later analysis of individual well-being and satisfaction with different dimensions of life.

Given the critical importance of the nuclear family and other kin in providing social support (Larson, 1979), family structure, patterns of interaction, and the perceived quality of family life are analysed in some detail. The pre-impact quality of family life is an important part of the general quality of life in the study area (Campbell et al., 1976). The quality of family life is compared across communities (Edmonton, Fort McMurray) and differences by length of marriage, number of children, and the impact of life events (stress) are analysed.

1.5.4 Attitudes Towards the Community and Change

These indicators focus on residents' subjective assessments of the present situation and their evaluation of possible impacts of development. How often do people in the different communities within the study area discuss the topic of development? Do they approve of Esso Resources' proposals? Individual attitudes towards coordination of planning, the adequacy of consultation, and the ease of access to local officials provide a detailed description of perceptions of government involvement.

Residents' suggestions for improvement are described for each community and these suggestions are related to evaluations of various dimensions of housing and services. Finally, residents are asked to give their opinions as to who will benefit from development.

1.5.5 Individual Well-Being

A final set of indicators turns from opinions about the community and the general effects of change to individuals' assessments of their own well-being and the effects that development is likely to have upon them. To what degree do respondents report different negative and positive feelings (affect) and are they relatively alienated? Compared to individuals living in other communities such as Edmonton and Fort McMurray, are they relatively satisfied with various aspects of their lives? Do they report past improvement in their own financial situation? What do they expect for the future? Having asked respondents to give their opinions on the general effects of development, we also ask them to describe ways in which development might affect them personally.

Do people who have "firmer roots" in the community in which they live also report more positive emotional states and attitudes? Perhaps more extensive linkages with formal and informal social support systems (links with kin, friends, neighbours, and voluntary associations) are associated with less alienated psychological states among those who are more optimistic about the future.

1.5.6 Summary

Our purpose in this report is to describe and analyse social and economic conditions in the Cold Lake region to provide a pre-impact baseline for the assessment of future industrial development. As far as possible, this baseline must describe the patterns of change already existing in the region. Indicators have been selected from a wide variety of content areas to capture the possible consequences of change. The indicators include demographic factors, income, consumption, services, family structure and interaction, participation in formal and informal social networks, and respondents' attitudes towards development and change.

We have previously noted, that in order to identify changes that result from project development, we must be able to separate those changes from present patterns of change. By inference, this pre-impact study must attempt to construct a dynamic baseline in order to accomplish this objective. To do so it adopts several strategies:

1. Comparison of the study area with places which have experienced different conditions;
2. Comparisons across time using materials available in the census; and
3. Comparisons within the study area across sub-samples, across cohorts, and over individual histories.

1.6 Analyical Strategies For Establishing a Baseline

Johnson and Burdge (1974:69-88) describe a comparative diachronic study that begins with a comparative post-impact analysis of a community similar to the one in which development is to be assessed. Their design is illustrated in Figure 1.2. Between each pre-impact and post-impact assessment a resource development occurs. Community 1 and community 2 are selected to maximize their similarities and the development projects are presumed to be comparable as well(Johnson and Burdge, 1974:71). At this point we can only partially implement such a design. We will use Fort McMurray as the comparative case since it has already undergone resource development. Unfortunately, little pre-impact information is available for Fort McMurray, and both the community of Fort McMurray and the nature of the development project differ substantially from Cold Lake and the project proposed for that region. We are therefore left at present with a comparison at Time 2 (Figure 1.2) of communities that are imperfectly matched. Indeed, attempts to study matched communities have not been particularly successful in any case. No matter how careful the matching, too many differences always remain (Beck, 1972:106).

This is obviously a problem in comparing communities in the Cold Lake region with Fort McMurray. At no point in its development has this New Town had a similar socio-economic structure to that now present in the Cold Lake area. The greatest similarities probably existed after WWII before CFB

Figure 1.2 A Comparative Diachronic Design for the Study of Social Impact

	Time1	Time2	Time3
	Past	Present	Future
Community 1	Pre-impact Assessment	Post-impact Assessment	
Community 2		Pre-impact Assessment	Post-impact Assessment

Cold Lake was built, but even then Fort McMurray was a relatively isolated trapping, trading, and transport center with no significant farming community.

We are left, therefore, with imperfect comparisons. We cannot be at all certain that what happened in Fort McMurray will happen in the Cold Lake Region. Indeed, given the differences between the two areas and the advantages of history (the experience of Fort McMurray and other resource developments), such outcomes are extremely unlikely. Still, the comparison is useful, if only to point to indicators that did or did not reveal signs of social impact (negative or positive) as the result of rapid growth. In one sense, the comparison is worthwhile if only to more effectively utilize our experience in resource development to better plan future developments. While we cannot be certain why things are the same or different in the two cases, comparative observations stimulate speculation and the search for furthur evidence.

A second reason for pursuing such comparisons is the valuable, larger perspective that they bring. Without such a comparative perspective, it is difficult to judge the absolute magnitude of observations on many social indicators. For example, how else can we judge attitudes or satisfaction scores measured in artificially created units (for example, on a seven point scale from dissatisfied to satisfied)? How else can we tell whether the population of an area has a high proportion of young or old people, or whether the reported frequency of interaction with neighbours indicates a relatively tight-knit community? In order to interpret the results of our pre-impact assessment, we must put these indicators in context. Such efforts go beyond comparisons with Fort McMurray to include comparisons with Edmonton and with broad areas such as all of Alberta or Canada, when data is available. Both the Edmonton Area Study (1979) and the AOSERP survey of Fort McMurray (1979) are described in more detail in the following chapter on Research Methods.

1.6.1 Comparisons Over Time

A second comparative strategy also focuses on the community as the unit of anlysis. It establishes analytical control by comparing the community at some previous time with results from present observations. While we cannot fully implement this part of the design illustrated in Figure 1.2 above, we can examine changes over time for the limited range of indicators available in the census. In some respects, these comparisons go far beyond demographic data and analysis presented in either the Cold Lake Oil Sands Sub-regional Study (Municipal Affairs, 1978) , or the draft Socio-economic Impact Assessment prepared in support of Imperial Oil's Cold Lake Project (Resource Management Consultants, 1978).

Unfortunately, little information is readily available from the 1951 census for the separate communities of the region. Such information would be necessary to provide pre-impact measurements relevant to the building of CFB Cold Lake in the mid-1950's. However, evaluations of available census (1961, 1971) and inter-censal (1966, 1976) materials, as well as estimates derived from the present 1979 pre-impact survey do allow limited post-impact assessment of the development in the region. This assessment includes description and analysis of indicators of population growth (fertility, mortality, migration), and population composition (age and sex, marital status, labour force participation and housing). It does not seek to project or forecast future trends. Observations at 4 points over an 18 year period do not allow the identification of those factors which caused observed stability or change. We can, however, observe both the rate and direction of change for the limited indicators that are available. This information aids comparisons with other communities and wider comparisons with Alberta and Canada.

1.6.2 Comparisons Within the Study Area

1.6.2.1 Cohort Comparisons

A third strategy in establishing a dynamic baseline can be used throughout our analysis. It involves the comparison of synthetic cohorts. A cohort is defined as a population or sub-group having some trait in common, usually a major life event (birth, marriage, migration) experienced within some particular period (often five years in length). Cohort comparisons usually assume that as younger (or more "recent") cohorts mature, they will become like older cohorts. This in turn assumes that the effects on development of exogenous factors (for example, general developments within the society) are approximately constant over time. Factors which affected development in the past are assumed to do so in the future.

Birth or age cohorts and migration cohorts are particularly useful for our purposes. Birth cohorts are defined to include all the people in our sample of the study area born within a particular five year period. Migration cohorts are defined as groups of residents who came to the Cold Lake region during the same time period. For our sample results, both age and migration cohorts do not include those who died or left the area. This rather major caveat aside, the comparison of age cohorts allows identification of life cycle changes that are part of the "normal" maturation experience of the population. Comparisons of marriage cohorts or examination of the effects of length of marriage do much the same thing. Comparison of migration cohorts may indicate changes over time in the kinds of migrants who have moved to the area (and stayed). It will also provide a basis for inferences about changes that have already occurred in anticipation of development.

1.6.2.2 Sub-sample Comparisons

Sampling frames were designed to provide separate estimates for CFB Cold Lake, each of the three towns in the area (Cold Lake, Grand Centre, and Bonnyville), the three smaller settlements as a group (Glendon, Ardmore, and Fort Kent), the rural area, and the two Metis settlements of Fishing Lake and Elizabeth. Survey results for CFB Cold Lake and the Metis Settlements are reported in separate volumes (Report III and IV, respectively). Here we compare the samples interviewed in Bonnyville, Grand Centre, Cold Lake, the rural farm area, and rural non-farm areas (primarily villages). These breakdowns are necessary, given the expected differences between sub-samples, and the probable different impact of planned developments. At the same time, comparisons of these different areas within the Cold Lake region augment comparisons between places. Such comparisons allow a more accurate description of pre-impact conditions.

1.6.2.3 Relationships Between Indicators

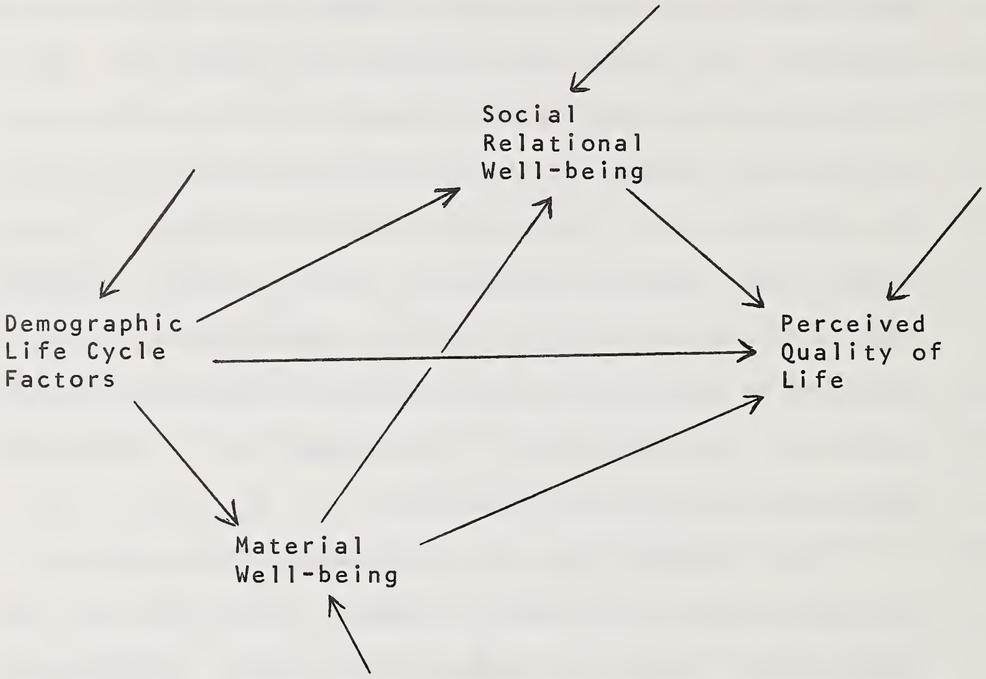
A fourth strategy in establishing a dynamic baseline uses individual respondents and their families as their own "anchor points" for comparisons across time. Through retrospective questions, respondents are asked to indicate what circumstances they were experiencing at some previous point in time. For example, they were asked to recall where they grew up, what education they had completed, what moves from one place to another they had made, and so on. In this manner, present material well-being, for example, may be thought of as a product of past experience, education, and a number of "ascribed" statuses (sex, ethnic status etc.).

This method analyses status attainment as an important basis for the quality of life enjoyed by individuals and their families. In this sense, our presentation of indicators is organized in a crude "causal hierarchy". Each set of indicators is used in analysing those that follow. Demographic factors are used throughout the report to identify life cycle differences that are part of "normal" maturation. Such changes can then be separately identified in post-impact assessments of development. Secondly, demographic factors are used as social locators to identify groups within the population of the study area that may potentially suffer adverse effects or perhaps benefit greatly from proposed developments. Demographic characteristics are used to search for groups that may be relatively materially advantaged or disadvantaged, or that may be relatively cut-off from local social support networks or enjoy particularly strong support. In a similar manner we can search for those with a relatively high incidence of family problems, or difficulties in other areas .

Both demographic characteristics and indicators of material status (for example, income, level of living, debt, housing) are used to analyse the perceived quality of housing, service, and other aspects of the quality of life within the community. Status differences are also utilized to identify possible barriers to participation in various kinds of social networks (kin, friends, neighbours, voluntary associations). Finally, participation in social networks is added to the analysis of attitudes towards the community and individuals' self-reports of their health, happiness, and future prospects.

The organization of this report thus follows a crude indicator model outlined in Figure 1.3. This is only a preliminary model of indicators of output of the process of human adjustment to change. It does not include many of the feedback loops that would undoubtedly be present in considering effects over time. It is presented here only as a guide to help organize and focus this preliminary analysis of pre-impact conditions.

Figure 1.3 A Preliminary Model of Indicators in a Pre-impact Baseline Study


Social Relational Well-being
Demographic Life Cycle Factors
Perceived Quality of Life
Material Well-being

1.7 Summary

The objective of this study is to establish a socio-economic baseline against which to assess changes that may result from the proposed Esso Resources development in the Cold Lake Region. This area includes: the towns of Cold Lake, Grand Centre, and Bonnyville; the villages of Fort Kent, Ardmor, and Glendon; the rural area surrounding these towns and villages; Canadian Forces Base (CFB), Cold Lake; and the two Metis settlements of Fishing Lake and Elizabeth Lake as well as the Cold Lake and Kehewim Indian Reserves. Both CFB and the native settlements are dealt with in separate, special population reports.

The Cold Lake region began as primarily an agricultural settlement focused around Bonnyville. After WWII, the nature of the area was altered with the establishment of CFB, Cold Lake, an air base with over 5,000 residents. Both the nearby hamlets of Grand Centre and Cold Lake grew rapidly in response to this development. This growth still continues in Grand Centre.

Esso Resources' proposed development is thus the second large project to occur in the area in the last 30 years. It involves the in-site recovery of bitumen (heavy oil) and its upgrading into synthetic light crude. When in full production (late 1980's), it will produce about 141,000 barrels of refined oil per day. The plant will take over five years to build, and will employ as many as 10,000 workers in the construction. Industry projections show additions to the population of the region of about 20,000, actual outlay costs of construction of about $4 billion, operating employment of 2,000, and a yearly operating budget of $300 million.

In order to understand the existing socio-economic systems of the region before the impact of this massive project, an interview survey of a representative sample of adults was undertaken. The aim of a pre-impact baseline study is to identify changes that may arise as a consequence of conditions and processes already present and operating in the region. Future studies while development is underway and after it is completed will then allow attempts to identify changes that have arisen specifically from the development itself, and from secondary impacts that such a development will have. As the first step in a longitudinal study, this research represents a relatively unique opportunity to make both signficant improvements in research methods appropriate to the analysis of social impact and the formulation of development policy.

The foci of the investigation are two output indicators of the process of human adjustment: changes in opportunities and achievments, particularly material gain or loss; and changes in the quality of life. General indicator areas include:

1. Demographic factors such as age, sex, marital status, migration and other events conceptualized within a life-cycle framework;

2. Material well being, particularly income, consumption (housing, services), and debt;
3. Social well-being, focusing upon family life, informal participation in voluntary associations, and informal participation in kinship, friendship, and neighbourhood networks;
4. Individual attitudes towards the community and social change;
5. Subjectively reported individual well-being and expectations regarding the effects of change upon subjects themselves.

The analytical design attempts to construct a dynamic baseline - one describing pre-impact changes in the area. In order to infer change from a survey at one point in time, several strategies are used:

1. Comparisons are made to survey results from other communities (Edmonton and Fort McMurray), and to broader secondary data for Alberta and Canada. Such comparisons assist in uderstanding the magnitude of indicators by placing the study region in context. They also stimulate speculation and allow the examination of indicators that may have shown impacts of developments in other situations (particularly Fort McMurray).
2. As a second focus on the community as a unit of analysis, comparisons over time for the limited secondary (census) data available for the region are used. This goes beyond the 1979 survey to look at the

period 1961 through 1976 (a maximum of four time points).

3. For this census data, and for the survey data from the study area, the comparison of synthetic age and migration cohorts allows inferences about re-impact life cycle change. This analysis emphasizes the "normal" maturation changes involved in major life-cycle events: entering the labour force, getting married, having children, and growing older in the process. It also infers differences in the selection of migrants who came to the area during different periods (and stayed), and allows preliminary identification of some anticipatory, pre-impact changes that may have already occurred.
4. As an extension of the between-places comparisons outlined above, sampling frames were designed to facilitate the comparison of communities within the study area. Particularly useful in this respect is the comparison of the three "urban" town areas with the rural farm and rural non-farm (villages, acreages) residents. Such comparisons prepare for future identification of impact in different places within the region. This strategy is in turn extended beyond geographic differences to identify different socio-economic groups that may be particularly advantaged or disadvantaged.
5. Finally, individuals are used as their "own control" in an analysis of comparative, retrospective, individual

autobiographies. The individual's present status attainment (occupational prestige, income, level of living) can be viewed as a product of his or her past education and experience, as well as certain "ascribed" statuses (for example, sex). This analysis describes pre-impact change over time for individuals living in the region before construction begins. Such changes can be compared to those that occur after development is underway. Changes for newer residents attracted by the development can also be compared to those experienced by the present inhabitants of the area.

In presenting the wide variety of indicators selected for this pre-impact analysis, prior history variables and demographic indicators are used to interpret differences in material status. In turn , past history, demographic, and material status differences are used to try to explain differences in the quality of housing and services, and participation in both formal and informal social networks. Finally, indicators of participation are added to examine attitudes towards the community, the change it has undergone and will undergo, the individual's own well-being, and future prospects. This preliminary, hierarchical indicator model, while it is only crudely specified, and while it ignores feedback loops, provides a focus for the explanation of variation within the study area, and complements analytical methods employed to infer change.

2. RESEARCH METHODS

2.1 Introduction

This chapter discusses the research methods employed in the Cold Lake Baseline Study: Phase II. Much of the technical detail is presented separately in Report VI. Tn this chapter we have attempted to present an overview of our research methods. The various sections are presented chronologically beginning with the preparation and testing of the questionnaire and ending with a brief discussion of the comparative data employed in the analysis of the information collected as part of the Cold Lake Baseline Study: Phase II.

2.2 Questionnaire Construction and Testing

We were fortunate in that we had at our disposal an instrument which was both well suited to examining the issues central to this study, and which had been tested extensively under very similar conditions. Thames Group Research was responsible for a study of the impact of development on Fort McMurray and as part of that study had developed a questionnaire which could be modified to suit the objectives of the Cold Lake Baseline Study. This questionnaire examined such issues as:

1. the social mobility of respondents
2. the integration of the respondent into his or her community

3. the respondent's perception of his or her community
4. the health of respondents
5. the stresses and strains experienced by those living in a growth community
6. the family life of respondents
7. the material well being of respondents

Although the existing instrument had been administered to 430 respondents in Ft. McMurray, we felt that because the present study was a baseline study and because there was a significant rural component in the sample that further modification and pre-testing would be in order. To this end, extensive discussions were held with knowledgeable individuals and among members of the research team. Based on these discussions, we were able to modify the questionnaire so that it was better targeted on the issues of concern in a baseline study and better suited to a study area containing a large rural population. This modification also had the added benefit of shortening the instrument and smoothing the flow of questions. Once these alterations were made, the modified questionnaire was taken into the field for pre-testing.

2.2.1 Questionnaire Pre-testing

Pre-testing was conducted by Ms. M. Ivanitz, Ms. C. Hume, Mr. H. Krahn, and Dr. D. Sunahara. The team members attempted to contact and interview respondents in as many diverse areas of the Cold Lake region as possible and also to contact respondents who were as diverse as possible in their social characteristics. This stress on diversity is important in that one objective of pre-testing a questionnaire is to determine whether it is appropriate for the various segments of the population under study.

To ensure diversity, the study area was subdivided into rural and urban areas. Five rural respondents, located both to the east and west of Bonnyville, four respondents from the town of Bonnyville, three from Grand Centre and two respondents from Cold Lake were purposively selected and interviewed. This sample of fourteen contained respondents with a wide range of personal histories. Both male and female respondents with varying degrees of participation in the labour force were interviewed as were individuals employed in both the agricultural and non-agricultural sectors. The ages of the respondents ranged from twenty-one to sixty-one. The sample also included life-long residents of the study area as well as respondents from other parts of Canada and other countries. Single, married and divorced respondents were also included in the pre-test sample.

2.2.2 Results of Pre-test

The heterogeneous backgrounds and characteristics of the individuals we interviewed provided an excellent opportunity to evaluate the routing and wording of questions. With respect to the routing of questions we found that only very minimal changes were necessary to produce a smooth flowing questionnaire. Similarly we found that only minor changes in wording were required. The few modifications required reflect the very extensive exposure and testing the basic instrument received as part of the Fort McMurray study.

On the basis of the fourteen pre-test interviews we concluded that the duration of the interviews was of an acceptable length, approximately 57 minutes. Interviews which are of this approximate length pose no problems with respect to fatigue on the part of either the respondent or interviewer.

None of the pre-test interviewers reported any difficulty resulting from questions being sensitive or embarrasing. It was decided, however, based on our previous experience with interviewers that the health related questions would be retained on separate sheets for respondents to fill out themselves. This decision was based on past reports of inteviewers who found it embarrassing to ask health related questions. None of the respondents during the pre-test had any objection to these questions.

Following the pre-test final adjustments were made to the layout of the questionnaire. These cosmetic changes made the questionnaire easier for interviewers to read and also made coding of the questionnaire more efficient. A copy of the questionnaire is included in Report VI.

2.3 Recruitment and Training of Field Staff

Recruitment of field staff began with the placing of advertisements for two Field Supervisors and two clerical assistants in the Bonnyville Nouvelle and the Grand Centre Sun. One Field Supervisor was to be responsible for the eastern half of the study area which included Cold Lake, Grand Centre, CFB Cold Lake, and the surrounding rural area. The second supervisor was responsible for the remaining area which included Fort Kent, Ardmore, Bonnyville, Glendon and the surrounding rural area. The dividing line between the two areas was roughly Road 892. Mrs. S. Diening was hired as Field Supervisor for the eastern half Mrs. C. Slusarski was employed to supervise the western half of the study area. The two Field Supervisors assumed responsibility for hiring clerical assistants.

After the Field Supervisors were hired, advertisements were placed in the local newspapers for interviewers. Applications from interviewers in the eastern half of the study area were taken first. It was our hope that by starting in Cold Lake, Grand Centre, and CFB Cold Lake, our work in the rural and western areas could be delayed until farmers were finished with the harvest. The Field Supevisors were responsible for taking applications from prospective interviewers and explaining to them the conditions of employment.

On Sept. 28 interviewer training for the eastern half of the study area began in Grand Centre. The training was conducted by Dr. J. Gartrell and Dr. Sunahara. The training program extended over five days. On the first day of training, prospective interviewers were interviewed and a detailed examination of the questionnaire was made. On the second day of training, the interviewers engaged in role playing in which they took turns interviewing one another. This is an especially important part of interviewer training in that it gives the interviewer a very realistic introduction to interviewing. On the third and fourth days of training, the interviewers were in the field. During this time they were required to complete two actual interviews. This was done to give them some experience at interviewing and to expose them to the procedures for making contact with a household and selecting a respondent from among the household members. On the fifth and final day of training, interviewers returned to Grand Centre for a debriefing session and a group discussion. During this final day, interviewers edited their completed questionnaires to ensure they had been completed correctly. They were also given the opportunity to discuss their experiences with other interviewers. It has been our experience that such group discussions are reassuring to new interviewers. With the completion of their training, on October 3, thirty-six interviewers were sent into the field to begin interviewing in the eastern half of the study area.

Interviewer training for the western half of the study area began on October 9 in Bonnyville. The training of interviewers followed the same format as was employed in the training of interviewers for the eastern half of the survey area. The actual interviewing in the western sector began on October 14 with sixteen interviewers under the supervision of Mrs. C. Slusarski. A copy of the Interviewer Training Manual is included in Report VI.

2.4 Sampling

The sampling procedure employed in the Cold Lake Baseline Study: Phase II, while complex in terms of its execution was relatively simple in principle. Dr. W. McVey designed and supervised the sampling procedures. The following discussion presents a brief outline of the sampling procedures employed in this study. For more detail see Report VI.

The study area was subdivided into eight sub-areas each of which constituted a sampling frame. The eight areas were:

1. The town of Cold Lake
2. The town of Grand Centre.
3. Canadian Forces Base, Cold Lake.
4. The village of Ardmore.
5. The village of Fort Kent.
6. The town of Bonnyville.
7. The village of Glendon.
8. The rural portion of MD 87 excluding cottages, the Indian Reservations of Cold Lake and Kehiwen and the Metis Settlements of Elizabeth and Fishing Lake.

Within each of these eight areas, the dwelling unit was the primary sampling unit (PSU). One household member 18 years of age or older was to be interviewed from each of the sampled PSU's. A systematic probability sample was adopted. This method of sample selection involves the selection of a sequence of PSU's separated on a list or on the ground by a predetermined interval. This sampling interval is determined by dividing the total number of housing units in the study area by the number of PSU's required. For example, if there are 1000 dwelling units in a study area and a sample of 200 PSU's is to be drawn, the sampling interval would be five. Every fifth dwelling unit is selected for inclusion in the sample. Randomness is introduced by two procedures. The first PSU selected is chosen randomly and then to avoid the danger of the sampling interval coinciding with a systematic pattern in the housing units, a new random start is periodically initiated.

Systematic sampling generates a probability sample. That is there is a known probability of a dwelling unit being included in the sample. Also this technique generates a proportionate sample within the sub-areas. When a proportionate sample is drawn, the proportion of units with a particular characteristic in the sample is be the same as the proportion of housing units in the population with that characteristic.

Based on adjustments to the 1976 census reports, estimates were made of the total number of dwelling units located in Cold Lake, Grand Centre, Medley, Bonnyville, Glendon and the rural areas of MD 87. Similarly estimates were made of the number of dwelling units in Ardmore and Fort Kent based on a field survey conducted by Earl Berger Ltd. in 1978. These estimates did not include institutional populations and a mobile home park which had recently opened in Bonnyville. These groups were sampled during the course of actual data collection.

Once the estimates of the number of dwelling units in each of the sampling areas and the estimated sample sizes were determined, sampling teams began the actual selection of households. For the urban areas and the villages, the sampling teams systematically sampled the areas using periodic random starts. Each sampling team was composed of a driver and a recorder. The driver was responsible for following the designated sampling route and the recorder selected the appropriate PSU's and recorded either the address or a desription of the sampled unit.

Because of the great distances involved, the same procedure could not be followed in the rural areas of MD 87. Rather, a rural sample was drawn using a large scale map of MD 87. A number was assigned to every quarter section unit which contained a dwelling unit (excluding lakefront cottages). After a random start in the northeast corner of the area, every fourth housing unit was selected. The sampling route proceeded from east to west, beginning with the northern most row of quarter section units until the western boundary of the study area was reached. The sampling route then proceeded from west to east along the next row of quarter section units. This procedure was followed until the entire rural area was covered.

2.5 Data Collection and Preparation

Data collection started at the beginning of October and was completed at the end of November. During the course of data collection, the Project Manager made weekly trips to the study area to discuss with the Field Supervisors any problems which may have arisen, collect the completed questionnaires and pay the field staff for their work. Also during this time, the Field Supervisors and their assistants carried out the telephone call back procedure (discussed below).

When the completed questionnaires were returned to Edmonton, they were first given to specially trained pre-coders. It was the task of the pre-coders to assign numerical codes to special parts of the questionnaire. For example, the assigning of the four digit occupation codes from the Occupational Classification Manual, Census of Canada, 1971 was the responsibility of one pre-coder who had extensive experience with coding occupations. Similarly special pre-coders were assigned to the open ended questions and other questions which required relatively complex codes.

Once the pre-coders were finished their work, the questionnaires were given to coders who transcribed the responses of the respondents and the special pre-codes to coding sheets. After this stage in the data preparation was completed, approximately 35% of the questionnaires were coded again. This verification check was performed to ensure that no systematic errors had been introduced into the data at the coding stage. The codebook and open-ended codes used by the pre-coders and the coders is included in Report VI. Once the verification checks were complete the coding sheets were submitted for keypunching and verification. Verification involves the re-punching of the data on a card verifier to catch mispunches.

While the data were being punched, the necessary Statistical Package for the Social Sciences (SPSS) (Nie et al., 1976) programs were developed for reading and documenting the data set. This program was then used to generate preliminary frequency distributions for all the variables contained in the raw data set. These frequencies were used to examine the data for wild codes and internal consistency. Where wild codes or a lack of internal consistency were detected, reference was made to the original questionnaires to correct the data. This procedure of generating frequencies and checking for errors was repeated until the data set was cleaned.

The last stage in the data preparation was the saving of the data and the SPSS control cards as an SPSS system file. The advantage of storing the data in this fashion is that the amount of disk space used is minimized and retrieval is more efficient.

2.6 Scales and Indices

The next step in the research was the construction of scales and indices. This was done to render the data more amenable to statistical analysis and substantive interpretation. For example, more than one question was often required to obtain one piece of information. A case in point is the procedure employed to determine how long the respondent had been employed on his/her current job. Two questions, the month the job began and the year the job began were asked so that the duration of the job could be calculated. The two separate questions were then combined to form a single index which indicated how long the respondent had worked on his/her current job. The indices which were developed were then stored as part of the SPSS system file. A detailed discussion of these indices is presented in Report VI.

Several sets of questions permit the construction of simple summated scales. Included in Report VI is a discussion of how these scales were constructed and a discussion concerning their reliability.

2.7 Call Backs

As part of the data collection procedure, telephone interviews were conducted with a sample of the completed interviews. These call backs were made to ensure that the interviews had in fact been done and to examine further the reliability of the data.

Supervisors or their assistants telephoned a sample of respondents and asked them certain of the questions that were asked as part of the initial face-to-face interview. These call backs were made approximately two weeks after the initial interview and an attempt was made to ensure that at least one call back was made for each interviewer. Eighty-three such calls were made.

Several types of questions were asked during the call backs. At one end of the spectrum we asked questions which were straightforward and factual such as the number of children resident in the household and whether the respondent owned a dishwasher. For these questions, we felt there should be almost perfect agreement between the answers given during the initial interview and during the call back telephone interview. The second type of question asked during the call backs again required factual information, but information we felt would be more difficult to recall. Examples of this type of question are the number of full time jobs the respondent had since entering the labour force and the number of days the respondent had spent away from the Cold Lake area in the year prior to the inital interview. We expected less agreement between the respondent's initial responses to these questions and the responses given during the call back for this type of question than would be found for the simpler type of recall question. The third type of question which was asked during the call back inteviews involved attitudinal questions. During the call backs, the respondents were asked again what they felt about certain aspects of their personal safety and community. We expected the lowest level of agreement for this type of question. A copy of the call back form is included as Report VI.

2.7.1 Results of Call Back Interviews

Four simple factual questions were asked, address, number of children resident in the household, year of birth, and whether the respondent owned a dishwasher. Table 2.1 presents the percent of respondents who gave identical answers during the face-to-face interview and during the telephone call back. The level of agreement between the responses given during the two interviews was very high as can be seen in Table 2.1.

Three additional factual answers were asked. These we felt would produce less stable answers because of the greater difficulty respondents would have in recalling the necessary information. Table 2.1 presents the correlations between the answers given during the initial interview and the subsequent call back interview. All the correlations in Table 2.1 are significant at the 0.001 level of significance.

The last three question in the call back repeated three

Table 2.1 Percent Agreement Between Initial and Call Back Telephone Interview

Question	% Agreement
Address	93.8%
Year of birth	97.5%
Number of children resident in household	97.5%
Do you have a dishwasher	100.0%

r^2 Between Initial and Call Back Telephone Interview

Question	r^2
When did you move to this area?	0.98*
How many full-time jobs have you had since you started working?	0.79*
Approximately how many days were you away from this area for a trip or vacation in the past year?	0.81*

r^2 Between Initial and Call Back Responses to Attitudinal Questions

Question	r^2
How safe do you feel walking alone in your neighbourhood at night?	0.44*
It is easy to make friends in this community.	0.44*
Life here seems to be a continual financial struggle.	0.37*

* $p < .001$

of the attitudinal questions asked during the initial face-to-face interview. Respodents were asked how safe they felt walking alone at night in their neighbourhood, whether they agreed with the statement that it was easy to make friends in their community and whether they felt life was a continual financial struggle. Table 2.1 presents the correlations between the answers given during the initial interview and the answers given to these questions during the call back interviews.

The results of this call back analysis are encouraging since they indicate that the questions we asked during the initial face-to-face interview generated data of reassuringly high reliability. As can be seen in Table 2.1 there is a very high level of agreement when factual infomation is required. Similarly, even when measures of subjective phenomena are taken at two points in time, there is still a strong correlation between the two measures.

2.8 Interviewing Results

Table 2.2 presents the outcomes of the interviews for six different regions of the study area. In this table, the area labelled Villages refers to Ardmore, Fort Kent, and Glendon.

The first column in Table 2.2 presents the total number of possible interviews in the various parts of the study area. It should be noted that these figures are not the same as those reported previously (Interim Report II, p. 23). The values in Table 2.2 include the institutional populations such as the senior citizen facilities in Bonnyville and Cold Lake as well as the bachelor's quarters in CFB Cold Lake. Also, the values indicated in column one of this table include new housing which was occupied after the sampling teams had completed their work

The second column in Table 2.2 indicates the number of households in each of the six areas with which interviewers were able to make contact. The difference between column one and two is that column two excludes those households which were vacant, could not be located, or were occupied but a member of which could not be reached. This column has been included so that when rates for the various outcomes are computed, the true population at risk can be employed in the calculations.

Column three presents the number of completed interviews in each of the six sub-areas. Columns four and five give the completion rates based on the total possible number of interviews and the number of households actually contacted. Columns six to eight give analogous figures for refusals. Column nine gives the number of households in each area which could not be contacted by the interviewers. Column ten gives the rate of no contact based on the total number of possible interviews. The values reported in column eleven (OTHER) include households which did not produce interviews for various reasons. Included in this column are households where there was a language problem, a problem with hearing or senility, households of either a Field Supervisor or interviewer, and households which interviewers felt were unsafe. Column twelve presents the percent of total households which did not produce interviews for these varied reasons.

The overall completion rate is most satisfactory. Of the total number of possible interviews, 81.5% resulted in a completed questionnaire. Completion rates for face-to-face interview surveys are often five to ten percentage points lower than the rate obtained here. With respect to the six areas comprising the study area, the completion rates ranged from a high of 85.2% in Grand Centre to a low of 71.9% in the villages. This relatively low completion rate for the villages, however, was not due to any antagonism toward this study on the part of village residents. In fact, when interviewers were able to make contact with the households, completed interviews were obtained in 81.0% of the contacted households.

The relatively low completion rate in the villages is attributable to an elevated rate of No Contacts and Other factors. Field staff reported that because of the distances involved, it was difficult for interviewers to make repeated trips to the villages to try and contact the sampled households. Also, it was reported that there were more occasions of language difficulties encountered in the villages than in other areas. The loss of an interview due to a language problem was classified under the Other column in Table 2.2.

2.9 Representativeness of the Sample

Once the data were prepared, the sample was examined for representativeness. The characteristics of the sample were compared with the data from the 1976 census. Because of the time between the collection of the census data and the collection of our sample, care must be taken in interpreting the following analysis. Any difference between our sample and the 1976 census may merely reflect the changes which have taken place in the study area in the past few years.

Prior to testing for representativeness, the sample was subdivided into an urban sample composed of Cold Lake, Grand Centre, and Bonnyville and a rural sample which included the remaining parts of the study excluding the Metis settlements and the military base. Canadian Forces Base Cold Lake was not included because census data for military bases are not released by Statistics Canada.

Two aspects of the samples were compared with the 1976 census data: the sex specific age distribution and the sex distribution. To examine whether the distribution of ages in our sample was different from the census data, a Chi-square goodness of fit test was performed. For both males and females, the distribution of ages in the urban sample did not differ significantly from the 1976 census figures (Males, $X^2 = 4.14$, $df = 4$, $p > 0.05$; Females, $X^2 = 4.14$, $df = 4$ $p > 0.05$). However, in the rural area, the distribution of ages in the sample differed significantly from the 1976 census (Males, $X^2 = 123.00$, df =4 $p < 0.001$; Females, $X^2 = 15.06$, df = 4, $p < 0.01$). There were relatively few young men and women in our sample compared to the census data and relatively large numbers of older respondents. This difference between our rural sample and the census data may simply be a reflection of the general trend for the young to leave the rural areas. The normal aging of the population may also account for the difference between the age distribution in this sample and the distribution of ages as reported by the census.

When the ratio of males to females in our sample is compared with the 1976 census, there is an apparent bias in the sample in favour of females. This occurs in both the rural and urban portions of the sample (Urban, $X^2 = 14.56$, df = 1 $p < 0.01$; Rural $X^2 = 8.13$, df = 1, $p < 0.01$). This is not an atypical result in field surveys of this kind. Although every effort is made to obtain interviews from males, it is difficult to achieve an unbiased split on sex. Males are not only more difficult to contact, they are also more likely to refuse to be interviewed. For example in this survey, the proportion of contacted males who refused to participate (0.138) is significantly greater than the proportion of contacted females (0.092) who refuse to be interviewed ($Z = 2.56$ $p < 0.01$). This sex bias, however, is not an insurmountable problem. By analysing the data separately for males and females, the problems stemming from a lack of representativeness by sex are controlled.

2.10 Weighting of the Data

The unequal sampling intervals and unequal completion rates across the various areas, cause certain areas to be over represented in the sample. The proportion of completed interviews to number of dwelling units in an area is not equal across all the areas of the study. For example, in Grand Centre there were an estimated 898 dwelling units. From this area we obtained 202 completed interviews, a ratio of 22.5 completed interviews for every 100 dwellings in Grand Centre. In contrast to this, the approximately 1,219 dwelling units in Bonnyville produced a total of 177 completed interviews, a ratio of 14.5 completed interviews for every 100 households. Consequently dwellings in Grand Centre were more likely to produce a completed interview than were dwellings in Bonnyville.

This kind of bias can produce distortions when estimates are made of the characteristics of the population in the study area. The following hypothetical example illustrates the effect of having disproportionate representation. Suppose the population of TOWN A was comprised of 20 respondents, each earning $10.00 per hour. Similarly, suppose the population of TOWN B was comprised of 10 respondents, each earning $7.50 per hour. The true average income for the two towns together would be $9.17 per hour ((20 X $10.00) + (10 X $7.50))/30. Further suppose that a researcher's effort produced a disproportionate number of interviews from the two towns; 15 from TOWN A and 5 from TOWN B. If the researcher then calculated the average income from his 20 respondents ((15 X $10.00) + (5 X $7.50))/20 = $9.38 and used this average as an estimate of the average income of all 30 people living in the two towns his estimate would be too high.

To adjust for the problem of disproportionate representation from the various areas, a simple weighting can be done of the cases from the various areas. Weights were assigned so that the ratio of completed interviews to dwelling units was equal to the number of completed interviews to dwelling units for the Villages. That is, the sample was weighted to conform to the ratio of completed interviews to dwelling units for the Villages. The weights which were assigned to the various sub-areas within the study area are presented below.

1. Villages = 1.00
2. Cold Lake = 1.214
3. Grand Centre = 1.020
4. CFB Cold Lake - PMQ's = 1.228
5. CFB Cold Lake - Barracks = 1.292
6. Bonnyville = 1.500
7. Rural = 1.132

The total weighted sample size is approximately 1311.[1]

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[1] The total weighted sample size may vary slightly from computer run to computer run because of the way in which the computer rounds.

2.11 Comparative Data

In the analysis of the Cold Lake Baseline Study: Phase II data set, we had available, in addition to the secondary data published by Statistics Canada, two additional data sets. The first of these was the Edmonton Area Study, 1979. The second data set was the A Study of Human Adjustment in Fort McMurray (1979). The Fort McMurray data were collected by Thames Group Research only a few months prior to the field work for the current study. field work for the current study. The availability of these data sets permits comparisons to be made between what obtains in the Cold Lake area now and the experiences of Fort McMurray and the situation in the Cold Lake area with the conditions which obtain in a large urban area.

2.11.1 The Edmonton Area Study

The Edmonton Area Study (EAS) is conducted annually by the Population Research Laboratory, Department of Sociology, University of Alberta.[2] The sampling frame for the 1979 EAS was a list of addresses compiled in 1978 by the City of Edmonton from their yearly civic census. A sample of 584 addresses were randomly sampled from the tape. As in the Cold Lake study, the dwelling was the Primary Sampling Unit (PSU). During the approximately two months of data collection, 19 dwellings were found to be vacant or demolished and were subsequently replaced by another random selection. From the 584 sampled addresses, 440 interviews were completed giving a completion rate of 75.3%.

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[2] For a more complete description of the sampling procedure, see Kennedy, L., 1979 Edmonton Area Study - Sampling Report. Dept. of Sociology, University of Alberta; Population Reseach Laboratory.

To be eligible as a respondent, individuals who resided in the sampled PSU had be 18 years of age or older. In family units, the respondent was usually one of the spouses. In non-family units, any adult resident could qualify as a respondent. The only additional restriction which was imposed by the EAS was that for the initial third of the sampled PSU's, interviewers were instructed to ask for the male household head to ensure a representative split on the number of male and female respondents.

The EAS questionnaire involved a fixed schedule of questions administered by trained interviewers. The topics covered in the questionnaire ranged from the cost of day care facilities to religious preference. The expertise of the Population Research Laboratory is widely recognized. The EAS provides comparative data of very high quality which are representative of the Edmonton population.

2.11.2 A Study of Human Adjustment in Fort McMurray

A Study of Human Adjustment in Fort McMurray was a social impact study conducted by Thames Group Research and The Population Research Laboratory, Department of Sociology, Univerity of Alberta for the Alberta Oil Sands Environmental Research Program. Data collection for this study took place during May and June 1979. Like the present study, the dwelling unit functioned as the PSU. Within each of the six sub-communities making up Fort McMurray, a systematic sample was drawn producing 624 PSU's. After the households were selected, a member of each household was selected randomly. To qualify as a respondent the household member had to be 16 years of age or older and resident in the sampled household. The 624 PSU's resulted in 430 completed questionnaires giving a completion rate of 68.9%.

The questionnaire employed in Fort McMurray is very similar to the instrument employed in Cold Lake. Consequently there are a large number of issues examined in the two studies which can be compared. The main area of difference between the two instruments pertains to the conditions surrounding the respondent's move to the study area. This area of inquiry is obviously more relevant to communities which have already experienced rapid development than it is to areas such as Cold Lake which are simply anticipating rapid development.

2.12 Summary

There are several distinctive aspect to this research design. The first of these is the large size of the sample There were two reasons for drawing such a large sample. A long term objective of this research is to collect data from the same respondents at several point in time over a space of ten years to see how respondents have changed. One difficulty with such logitudinal "panel designs" is the loss of respondents. To compensate for this expected loss, a sufficiently large sample must be drawn initially to ensure that by the time the research is complete there is still a sufficient sample of respondents available to permit data analysis. The second reason for using such a large sample was to ensure that there were enough respondents from each community to allow separate statistical for each of these areas.

A second distinctive feature of this research was the response rate. We were fortunate to obtain a very high completion rate. A response rate of over 80% reflects very positively on the quality of the Field Supervisors and Interviewers engaged in this research.

One final feature of this research deserves comment. In performing telephone call backs, we were able to examine the reliability of our data. While many survey researchers are able to examine the reliability of their data using statistical techniques, few have examined the reliability of their data over time. The telephone call backs allowed us to check the over-time reliability of our data and the results of this procedure were most reassuring.

The completion of the Cold Lake Baseline Study: Phase II marks the end of the first stage in this research. The emphasis in this research has been to examine differences among the current residents of the study area. This in and of itself is not informative with respect to the social impact of the proposed Esso Resources heavy oil plant on the lives of local residents. To begin to unravel the consequences of such a massive project requires following the current respondents over time and selecting new samples in the future so that changes in the composition of future populations can be examined.

3. BASIC DEMOGRAPHICS OF A RESOURCE AREA

3.1 Introduction

Preparatory to any analysis and discussion of demographic change, it is imperative to be aware of the more significant historical events which have served as stimulators of population change. Over the past eighty years, the Province of Alberta has experienced several noteworthy changes with regard to the magnitude and character of its population. Although this chapter presents data and analysis for a more recent time dimension -- 1961 to 1976 -- it is important to recognize that these recent population changes are in response to the more encompassing social and economic trends affecting Canada as a whole, and the Province in particular. Comparative population statistics will be incorporated where appropriate to highlight these salient trends from a provincial perspective.

Alberta's population growth between 1901 and 1976 bears a resemblance to the general population growth in Canada. A closer look at the historical trend of Alberta's population growth reveals that while population increased markedly between 1901 and 1921, there was a levelling off between 1921 and 1941 before resuming an upward surge.

As revealed in Table 3.1, the largest percentage gain of 412.6 per cent occurred in the 1901 to 1911 censal decade. The largest numerical increase for Alberta was found in the 1951 to 1961 decade with a growth of 392,443, or a 41.8 per cent increase over the inter-censal period. These two major growth periods in the province's population history represent the demographic response to different economic conditions.

During the first decade of the twentieth century, large scale immigration of foreign-born populations combined with natural increase contributed to the high growth rate in Canada. This favourable combination resulted in an increase of approximately two million people for the country. This growth represented the highest percentage change during any single census decade for the nation since the turn of the century. Alberta enjoyed a considerable share of this increase. This initial stage of major growth in the province was chiefly due to the wave of immigrants arriving from European countries in response to Canada's active endeavors to promote a wheat economy in the Prairie Provinces.

During this period in Canada's history, the Prairie Provinces could be considered 'the frontier area' of the country. With the opening of the Trans-Canadian railway and the policies enacted by the Canadian government to encourage settlement in the western provinces, immigrant populations with agricultural experience and skills and hardened to the harsher conditions of rural life began to settle in Alberta.

Government inducements played a major role in the enticement of immigrants to leave their homelands to settle in relatively unknown environments. Of the forty million acres of land amenable to farming and wheat production, approximately twenty million acres were made available by the federal government in the form of free homesteads. These homesteads were about 160 acres in size and were subject only to residence and cultivation requisites. Settlement by homesteaders, "... once it commenced, was in the form of a number of sudden, almost explosive, population movements." (Gertler: 116).

During this early growth stage in Alberta's history, the population increased over five-fold, from 73,022 in 1901 to 374,295 in 1911, with the greatest share of the increase occurring in the latter part of the decade. This population movement contributed to Alberta's ethnic mosaic which still influences the provincial population character today. In addition, this immigration wave coupled with the developing agricultural base triggered the establishment of the small community system that was so characteristic of the Province's early history. The small service community with its railroad siding and grain elevators began to spread throughout the prairie region (Zimmerman & Moneo, 1971).

The depression years of the 1930's had their impact upon North America and served as a curtailing influence both upon immigration as well as natural increase. As would be expected, Alberta was not excluded from experiencing the impact of economic hardship. This decade was one of transition, in that the Canadian economy shifted from the low ebb of the early 1930's to that of recovery in the late

1930's as the nation began economic mobilization in preparation for participation in the Second World War. The war demands placed upon manufacturing and industry had pronounced impact upon the more industrialized provinces, such as Ontario and Quebec.

Attenuation of Alberta's population growth is revealed in Table 3.2 by five-year census intervals for the 1931 to 1946 period. In addition to the decline in immigration as a consequence of economic adversity during the 1930's and the Second World War in the early 1940's, there was a heavier than average flow of migrants out of the province during this period. Reduction in employment opportunities during the depression years influenced the search for job availability in other provinces. The migration flow shifted from the agricultural areas to the manufacturing and industrial areas of Canada.

Coupled with this shift in the migration pattern was the significant decline evidenced in fertility. This primary contributor to natural increase reached a low of about twenty births per thousand population between 1936 and 1938 in Alberta. The economic strains placed upon the Albertan family influenced a retrenchment in normal reproductive behaviour. Recovery from these low fertility levels in the 1930's for Alberta did not commence until the early 1940's. It is important to recognize that both sources of population growth were at their lowest ebb during the depression years. The resurgence in the Alberta birth rate reached record highs between 1953 and 1956 with births exceeding 31 per thousand population. It is worthy to note that the Alberta birth rate was in excess of 27 per thousand over an eighteen year period from 1946 through 1967 -- an important contributor to the overall growth of Alberta's population in the post-World War Two years. Alberta's fertility began to decline following 1963 reaching an all-time low of 17.4 in 1973 and 1974.

The movement of population precipitated by the unstable conditions of the depression years contributed to the achievement of parity between the rural and urban proportions in Canada during the 1930's (Stone, 1968: 29). Stone estimated that fifty-two per cent of the Canadian population were residing in urban communities by the time of the 1931 Census. The pattern of migration began to alter significantly in favour of the urban centre. It is noted, however, that this balance did not shift for Alberta until 1961 (McVey, 1976: 7). Prior to 1941, internal movements of population involved people of rural origin seeking better agricultural land, in other words, migratory patterns within rural areas which had little direct effect upon urban development.

The technological benefits in agriculture, however, began to have their impact upon the migratory patterns such that the trend toward the urban community increased in momentum for the nation as a whole. These technological changes, initiated before the depression period and augmented by a perception of employment opportunity and prosperity in the city, continued to influence the rural to urban movement which extended into the war years. Since this was a period of insecurity (1930's) and manufacturing establishments were hesitant to expand and provide the needed employment opportunities in the urban centres, the industrial mobilization brought about by the war years started Canada on the road to economic rejuvenation.

Canada's involvement in the Second World War brought about a major period of technological change in the nation's history. There were continued declines in the agricultural work force and the consequent creation of surplus labour was quickly utilized in the manpower mobilization required in the manufacturing and industrial centres for the war effort. Synthetic materials and products were developed to replace commodities in critical shortage. These efforts contributed to the expansion and diversification of new industries that benefited the Nation well into the post-war period. Innovation and experimentation in production processes, resource recovery and exploration equipment, synthetics, and the utilization of by-products during this period set the stage for Alberta's emergence into the industrial scene.

The result of these endeavours was new and greater employment opportunities in the urban centres at a time when the labour supply was restricted. This condition forced attention to be directed toward a previously under-utilized source of manpower -- the female. The attraction of the urban centre was now not only for available males but also for surplus females from the rural areas. Predominantly rural areas, such as the Prairie Provinces registered significant increases in the urban populations during the 1941-1951 decade with each province gaining more than ten per cent.

Following the close of hostilities, industrial concerns continued their research into new fields of development which not only involved further diversification but exploration for new resources. When emerging resource areas develop and expand, further stimulation of urban growth occurs as a consequence of new employment opportunities and establishment of kindred industries. Alberta's second major growth stage was contingent upon the oil and gas discoveries made shortly following the Second World War. Resource exploration and development stimulated the formation of the single-enterprise resource community, such as Fort McMurray, Grande Cache, and Fox Creek, as well as generating re-vitalization of existing communities.

This spectacular growth period for Alberta was an expression of a rise in the number of in-migrants coupled with an upsurge in the birth rate. The in-migrants were largely from other provinces rather than from foreign countries, as was the case in the earlier period of provincial growth. After 1946, Alberta's population experienced a growth rate of more than three per cent per year which was faster than that of Canada as a whole. It should be noted that the population trend in Alberta reflects the population growth manifested in both Edmonton and Calgary, the two largest urban centres in the Province. This upsurge in population was precipitated by the change from primarily an agricultural economy to an industrial one. With the discovery, exploration, and development of provincial resources, new attraction forces for migration were brought into play.

Agriculture, although still important in Alberta, was playing a lesser role in the provincial economy. At the time of the first major oil discovery in 1947, agriculture was the leading industry and accounted for over half of the Province's net value in production. Following the oil and gas discoveries and subsequent developments, the industrial area of mining, manufacturing, and construction accounted for 67.2 per cent of the net value in production by 1957 (Gertler, 1960: 119). These industries have influenced the growth in Alberta since the end of World War Two by attracting professional people, allied services, construction workers, and labour force populations to work in the new petro-chemical industrial concerns.

While migration played a significant role in Alberta's post-war growth period, natural increase experienced a resurgence from 1946 to 1960. Birth rates for the Province increased from 24.7 in 1945 to 31.8 in 1954 and declined slightly to 30.2 in 1960. This fifteen year period of exceptionally high birth rates comprised Alberta's 'baby boom' years. This renaissance in fertility extended for a somewhat longer period in Alberta than it did in other provinces of Canada. Contributing to this high fertility period was the post-war migration of young adults in their early maturity stage of the life cycle. In other words, the risk of childbirth was at its greatest within the Province during this period.

In concert with this favourable risk population, fertility behaviour was responding to the post-war period of prosperity. Families and married couples who had deferred having children during the depression and war years were resuming active involvement in family formation. Fertility increased substantially in the younger age cohorts for the 1951 and 1961 years (McVey, 1976, p. 11-12). Young married couples were quickly commencing childbearing following marriage and became the leading contributors to the fertility levels in Alberta. Other factors influencing this post-war 'baby boom' phenomenon were the return of the military from overseas assignment, continuing increase in the marriage rates, lowering proportion of childless marriages, and the continuing decline in the age at first marriage. All of these factors contributed to this unanticipated increase in fertility for the Province of Alberta.

Ramifications of the shifting migration pattern and the change in reproductive behaviour were felt by the two major cities of Alberta. Edmonton and Calgary became the principal urban focal points for the northern and southern portions of the province, respectively. By 1976, these two metropolitan cities had captured over fifty per cent of the provincial population. Urban trends that had started initially in the major cities of the east and far west were now being experienced in the Prairie Provinces.

As a consequence of Alberta's industrial emergence, the provincial capital with its many governmental functions has added several industrial concerns over the past thirty years. These new industrial interests are chiefly due to the natural gas and oil developments in the province. The consequences of such large scale petro-chemical growth are many. Chief among them being the attraction of not only new workers, but also their families and other dependents. In addition to the arrival of the oil and gas industry-related workers in large numbers, there was an attraction for new service-related populations.

In conclusion, the two major growth stages in Alberta's population history have been significantly influenced by different economic factors -- agriculture and the petro-chemical industry. The character of Alberta's population has been shaped by the migrants who responded to these important economic developments.

The immigration wave of the early 1900's contributed to Alberta's ethnic character comprised chiefly of British, German, Ukrainian, and Scandinavian populations. Associated with these immigrants were the traditionally-oriented family values supportive of high fertility levels. The second growth period brought to Alberta, migrants of a somewhat different orientation. Migrants with more industrial-specific skills, urban lifestyle, higher educational attainment, and smaller family values arrived in increasing numbers during the post-World War Two period.

Associated with these economic-precipitated population movements into Alberta, several more far-reaching social trends have also influenced the character of today's population through the alteration of lifestyle. As already noted, increased participation of females in the work force, increased mobility of the population, the changing urbanization pattern, the trend toward a smaller, more mobile, family size as evidenced by the downturn in fertility, the lessening of social isolation through improvements in communication and transportation technologies have all had consequences for the growth and distribution patterns of the population. The three basic components of population change -- fertility, mortality, and migration -- are directly and indirectly influenced by prior demographic composition and the economic and social trends which have prevailed over the course of the Province's history. The complexity of the interaction between the demographic components and socio-economic trends can, perhaps, be demonstrated with a few simple illustrations.

The Province's economic potential will influence the migration pattern, in that economic opportunity will attract young people -- either young, single transient workers or young married couples in their prime childbearing years. Contingent upon social or cultural pressures to have children or economic constraints not to have children will, in turn, influence the fertility levels. Alternatively, young married couples may feel the necessity that both husband and wife must work in order to maintain the lifestyle they desire as a household unit. The consequences of this choice would be the contribution to female labour force participation; and the subsequent decline in fertility and maintenance of small family values. The interactive effect of the demographic composition and the prevailing socio-economic trends and values will result in a changing population character.

Correspondingly, continued stimulation of the resource community will attract an increasing number of new migrants to the province. As the petro-chemical and allied industries provide the economic 'pull' for new migrants, the receiving communities will experience an alteration in their population composition. It is well supported in the literature that small towns and villages are characterized by a population with an older age structure which is the consequence of the normal aging of the resident population, as well as the relocation of retired farm populations (Summers & Clemente, 1976; McVey, 1978). The younger, and more occupationally competitive, migrants into the smaller community in Alberta can effectively alter the population composition by generating a younger age structure. The selectivity of the migrant population in terms of age, stage in the life cycle, marital status, family size, occupational and educational status can result in consequences for the recipient community. Not only are the migrants younger than the resident population, they are also in the early maturity stage of the life cycle and, therefore, have the potential of contributing to a rejuvenation of the population structure through fertility. Other consequences could be in the form of migrant adjustment problems, employment and occupational competition with the older resident population, and unanticipated strains placed upon housing, health, social, and community services. Demographic change in a population's composition can have far reaching implications for the smaller community, particularly the resource community which has the economic attraction for the migrant. (McVey, 1978).

Given the foregoing historical scenario and brief review of salient demographic and socio-economic trends at the provincial level, it is now appropriate to address the Cold Lake Resource Area specifically.

3.2 Methodological Considerations.

The tables and figures that follow portray selected demographic variables retrieved from census sources. These data were accessed through the Population Research Laboratory and the Alberta Bureau of Statistics. The census data were gathered for the Cold Lake Study Area and its component parts: Bonnyville, Cold Lake, Grand Centre, and the rural portion of Municipal District 87. Where appropriate, data comparisons are made with the Province of Alberta.

Census data are characterized by a temporal-spatial dimension, in that data collected during a census undertaking are linked to a spatial unit and are specific to a census moment. The census moment is defined as June 1st of the census year ending in 1 or 6. In this sense, census data are cross-sectional in nature and can be viewed as indicators of the population's status and character at a particular moment in time. For this analysis, four census periods were utilized (1961, 1966, 1971, and 1976) which permits discussion of change by comparing the cross-sectional indicators for two or more census periods.

The selected variables under consideration in this analysis include age and sex composition, marital status, labour force participation, and migration status. The labour force variable was not available for the 1966 census period and the migration status variables were available only for the two most recent census periods -- 1971 and 1976.

The Census of Canada incorporates the de jure method of enumeration whereby each individual is counted as an inhabitant of his usual place of residence, i.e., where he sleeps and lives most of the time. It should be noted, however, the manner by which several unique populations are enumerated. For example, armed forces personnel are counted where they are stationed; university students are considered residents of the community where they attend their institution; institutional populations, such as inmates, nursing home patients, and the like, are counted as residents in the localities where the institutions or group quarters are located; and persons without an usual place of residence, such as transients, are counted where they are found at the time of the census.

Knowledge of the census procedures for handling such a massive, nation-wide undertaking is essential for understanding the limitations of the data. Because of the dynamic nature of our population, there are many difficulties that the enumerator encounters in a de jure census which contribute to error through omission or duplication. It is assumed that these two types of errors will be compensating. One of the main contributors to census error in the past had been enumerator bias in the face-to-face interviews characteristic of the 1961 and 1966 Censuses. New census procedures were introduced in 1971 for economic reasons, as well as for the purpose of reducing enumerator error (Kalbach & McVey, 1979: 10-11). The self-enumeration approach utilized in the 1971 and 1976 Censuses required the respondent to complete a mail-in questionnaire which had been left at his home and return the form to the local census office. This 'householder approach' served to reduce the type of census error produced by interviewer bias and coverage omission and duplication. Most rural areas, however, still depended on the 'canvasser approach' as would be the case for the rural portion of MD 87.

The basic census statistical unit for which data is collected, in the detail required, is the enumeration area. In the hierarchy of census statistical units, the enumeration area is the basic building block as it is the smallest spatial unit by which census data is available. Essentially, the enumeration area is an administrative unit originally designed for the purpose of collecting data in the field during a particular census period. The geographic size or scale of this unit is determined by the estimated population size utilizing an optimum criterion of 375 households. Hence, the enumeration area boundaries could conceivably change from census to census as the population in the area changes. This attribute in itself makes it very difficult to achieve comparability in a study target area over several census periods.

Each of the towns of Bonnyville, Cold Lake, and Grand Centre consist of several enumeration areas which vary in number and identification in the census periods under consideration. Similarly, the rural portion of Municipal District 87 that corresponds with the remainder of the Cold Lake Study Area is composed of a set of enumeration areas. Since study areas normally do not conform to existing census statistical units, it is necessary to manipulate and aggregate a number of enumeration areas to approximate the study area boundaries for each of the census periods. Table 3.3 provides a listing of the enumeration area aggregation and identification numbers that correspond to the study area and its component parts for each census year.

The 1971 and 1976 Census figures shown in this chapter have all been subjected to a confidentiality procedure called 'random rounding'. This procedure was introduced in 1971 to prevent the possibility of associating small figures with any identifiable individual (Statistics Canada, 1979: 43). Under this method, each census data figure including totals are randomly rounded independently of each other. Since each data entry is independently rounded it is not unusual to find that the sum of the parts may not correspond to the total figure. All figures are randomly rounded, either up or down, to a multiple of five, e.g., an actual figure like 867 could appear as either 865 or 870.

The final methodological note to make at this time is concerning the exclusion of the Cold Lake Air Force Base and all Indian Reserves from consideration in this analysis. The rural portion of Municipal District 87 does not include these two distinct populations, as they are handled as significant population elements in other sections of this report.

3.3 Measurement.

In addition to percentages, three simple demographic analytical tools are utilized in this chapter. It is appropriate at this point to indicate what these measures are, their limitations and advantages, and their interpretation.

The effective fertility ratio, or child-woman ratio, is designed for use as a measure of fertility behaviour when more refined birth statistics and measures are lacking. Although more refined measures of fertility are available at the provincial level and for major sub-divisions, fertility data are virtually unobtainable or non-existent for small areas. The major advantage of this particular measure is that it can be easily calculated from age and sex data for smaller areas available through census sources. The computational formula is as follows:

$$\text{Effective Fertility Ratio} = \frac{\text{Number of children 0-4 years}}{\text{Number of females 15-44 years}} \times 100$$

It should be noted, however, that the children aged 0 to 4 years in the census tabulations reflect survivors only. The effective fertility ratio does not take into account those infants born and dying within this five year span. This weakness or limitation of the measure is only of concern in areas experiencing unusually high infant mortality. This measure is best utilized to compare the fertility behaviour of different segments of the same population, e.g., the fertility levels of Bonnyville and Grand Centre within the Cold Lake Study Area, as well as to assess change in this behaviour over time. In addition, the ratio can serve as an indicator of the youthfulness of the population. The procedure is to divide the number of children under the age of five, by the number of women in the childbearing years (15 to 44). An effective fertility ratio of 55 is then translated as meaning that there were 55 children for every 100 females aged 15 to 44 years of age.

A second indicator commonly used in the analysis of age composition is the total dependency ratio. This ratio relates the economically dependent population to the economically active population. Again, where detailed data are lacking at the small area level, the dependency ratio is often used as an indicator of the economic burden (or dependency load) that the productive segment of a population must support. The dependent population is simply viewed as those populations least likely to be active in the labour force. The computational formula is as follows:

$$\text{Total Dependency Ratio} = \frac{\text{Population } (0\text{-}14) + (65 \text{ and over})}{\text{Population aged } 15\text{-}64} \times 100$$

The weakness of this measure is that some persons defined as dependent are actually productive and some persons classified as 'active' are, in fact, economically dependent. For example, the active population as defined in the formula would include housewives, university students not active in the labour force, people who have stopped working at an early age due to ill health or physical impairment, and people who have retired early (Kalbach & McVey, 1979: 264). The total dependency ratio is influenced by the fertility levels, in that a large proportion of children would generate a higher dependency ratios for an area. A dependency ratio of 55 would mean that there is 55 persons in the dependent ages for every 100 persons in the active or working ages.

The Age and Sex Pyramid is a popular demographic tool of analysis in the study of a population's age and sex composition. An age-sex pyramid is simply the graphical portrayal of two histograms placed back-to-back, with the left side representing the five-year age cohorts for the males and the right side of the pyramid showing the five-year age cohorts for the females. The age groups are arranged in hierarchical order beginning with the youngest ages at the bottom and ascending to the oldest ages at the top of the pyramid. The sum of all cohorts represented in the pyramid for both sexes would equal 100 per cent of the population. The age-sex pyramids in this chapter, as well as in the Appendix, are based on a percentage distribution of the entire population. This permits inter- and intra-area comparison of the age and sex structure for the study area and its component parts. The age-sex pyramids which follow were prepared utilizing the CALCOMP plotter model 770/663 at the University of Alberta computer centre.

3.4 Population Change in the Resource Area.

As portrayed in Table 3.4, population change in the Cold Lake Study Area has been relatively uneven over the fifteen year period from 1961 to 1976. The two major growth communities -- Bonnyville and Grand Centre -- have experienced a population increase of 66.2 and 86.2 per cent since 1961. Of these two communities, Grand Centre is in relatively close proximity to the resource development project and, hence, is likely to benefit more directly from net migration than the town of Bonnyville.

Over the fifteen year censal period from 1961 to 1976, Grand Centre has manifested the largest population growth relative to the other components in the Cold Lake Study Area. As can be seen from Table 3.4, Grand Centre's population reflected consistent growth in each quinquinnial censal period. This represents an overall percentage change of 86.2, as compared with the second leading growth community of Bonnyville (66.2 per cent).

Possible sources of Grand Centre's population growth could either be the in-migration of retired farm population from surrounding areas; the increase in the fertility of

Table 3.4 Population and Population Change for the Cold Lake Study Area and Component Parts: 1961 - 1976.

Area	Population			
	1961	1966	1971	1976
Alberta	1,331,944	1,463,203	1,627,874[a]	1,838,037[a]
Total Study Area[1]	11,763	11,946	12,154	12,907
Bonnyville	1,736	2,237	2,589[a]	2,885[a]
Cold Lake	1,307	1,289	1,314[a]	1,317[a]
Grand Centre	1,493	1,731	2,166[a]	2,780[a]
Rural MD 87	7,227	6,589	6,085	5,925

	Population Change		
	1961-1966	1966-1971	1971-1976
Alberta	+ 9.9%	+11.3%	+12.9%
Total Study Area[1]	+ 0.7	+ 1.7	+ 6.2
Bonnyville	+28.9	+15.7	+11.4
Cold Lake	- 1.4	+ 1.9	+ 0.2
Grand Centre	+15.9	+25.1	+28.3
Rural MD 87	- 8.8	- 7.7	- 2.6

[1] Excludes Cold Lake Air Force Base and Indian Reserves.

[a] 1971 and 1976 data are actual figures taken from 1976 Census of Canada, Population: Geographic Distribution, Catalogue 92-805, Bulletin 1-6, June, 1977. Totals for these communities in the remaining tables will not match these actual figures due to the random rounding of enumeration area entries.

Source: Statistics generated from data made available in Census of Canada enumeration area tabulations are used for the total study area and the rural portion of MD 87 only.

resident population; increased migration in response to economic opportunities; increase in the share of military personnel and dependents living off-base; or the net effect of all the above sources in combination.

One potential contributor to Grand Centre's population growth is the Canadian Forces Base which is located in close proximity to the town. Examination of the Base's previous population trends reveals, however, that the Base population declined from 6,290 in 1971 to 5,430 in 1976. This represents a Base population decline of 13.7 over the most recent five-year censal period. Over this same period, the population of Grand Centre increased from 2,166 to 2,885 representing a growth of 28.5 per cent. In recent years, it is unlikely that the population change experienced by the Canadian Forces Base has contributed significantly to the population growth of Grand Centre.

As will be noted in a later section of this chapter, all of the components of the Cold Lake Study Area have experienced general declines in fertility levels over the fifteen year censal period. On the other hand, both Bonnyville and Grand Centre manifest increases in the very young population (aged 0 to 14 years). With the fertility declines, this contradiction suggests that the increase of population in the childhood years is essentially due to migrating families with dependent children. For Grand Centre, the likely source of population growth in recent years would then be the migration component.

Table 3.4 reveals that modest population growth was experienced by the study area as a whole. The Cold Lake Study Area reflected a 9.7 per cent change in population over the entire fifteen year period. The town of Cold Lake revealed minor population change in the earlier two censal periods and approached stability with 0.2 per cent growth over the 1971 to 1976 quinquinnial period. The rural portion of the study area (Rural MD 87) evidenced population declines in each of the five-year censal periods. This general population decline of the rural portion of the study area may simply reflect the combination of mortality effects and the out-migration of retired farm populations.

3.5 Age and Sex Composition of a Resource Area.

The population growth of the Cold Lake Study Area and its component parts can better be understood by a more detailed look at the respective age and sex structures, and changes therein, over the fifteen year period.

Composition refers, in essence, to the parts or ingredients that make up the whole. The vital processes -- fertility, mortality, and migration -- are the dynamic elements of the population, whereas, the composition of the population signifies its static elements. The more common compositional characteristics of a population are age and sex, ethnic origin, marital status, nativity, education, income, occupation, religion, and family status.

The composition of the population normally pertains to either ascribed or achieved characteristics. Ascribed characteristics are those which are assigned to the individual and the achieved characteristics refer to those which are open to individual choice or selection. For example, ascribed characteristics are age and sex, race, and to a certain extent, nationality. On the other hand, achieved characteristics would refer to those attributes such as marital status, education, income, religion and occupation.

Population composition is intimately related with the basic vital processes of fertility, mortality, and migration. These processes not only determine the age and sex structure of the population but are, at the same time, the effects of the population composition.

For example, interest may be focussed on the assessment of fertility within a resource area. The fertility level is the effect of a combination of characteristics, chief among them would be the age and sex composition. Specifically, the proportion of females in the child bearing years (15 to 44) and their fertility behaviour would influence the proportion of children in the age and sex structure. Conversely, as the proportion of women in the childbearing years changes as a consequence of earlier fertility and migration, the very composition of the population will have an effect on future fertility. It is understood that this simple refinement would not exhaust the possibilities as meaningful interpretations can be derived from other extensions (compositional characteristics), such as, ethnic origin, religious affiliation, nativity, and marital status. The simple extensions of age, sex, and marital status by age and sex would translate to married females aged 15 to 44 thus providing the investigator a population with characteristics specific to the interpretation of differing levels of fertility -- and potentially, differing effects upon the age and sex structure. As indicated, fertility may be a consequence or effect of the population's favourable age and sex composition and, on the other hand, fertility can influence or determine the composition of the population.

Similarly, mortality may be an effect of the age and sex structure. An investigator may be interested in the age distribution by sex because the risks of mortality increase differentially by sex as the population ages. Therefore, if any particular areas in the province had high proportions of elderly populations, one would also expect the consequence of high mortality rates relative to areas typified by younger age and sex distributions.

Migration, the final vital process, will also have an effect upon the age and sex composition. The resource area's economic potential will influence migration patterns, in that younger populations will likely be attracted to the area and its communities. Consequences of a large migration input into a resource area would include an increase in the fertility potential of its population, as well as a lessening of the mortality risk because of the more youthful populations involved (McVey, 1978). It has been determined in previous population studies that the young adult age groups -- 20 to 34 years -- are characterized by a higher degree of mobility, somewhat higher fertility than the resident populations, lower mortality patterns, and are more competitive in the existing job market.

In summary, the relationship between population composition and the vital processes is not a 'one-way street' as illustrated in the foregoing examples utilizing age composition as an influencing agent upon the fertility, mortality, and migration of a population. There is a reciprocal relationship where the vital processes, in turn, determine or influence the age and sex structure.

The most popular tool of analysis used in the exploration of a population's age and sex structure is the age-sex pyramid. Age-sex pyramids for the Cold Lake Study Area and its component parts have been constructed using the CALCOMP plotter for each of the censal periods. With the exception of the Study Area pyramids which will be discussed in this section of the chapter, the figures for Bonnyville, Cold Lake, Grand Centre, and the rural portion of MD 87 along with tabular presentations of the age and sex distributions will be found in the Appendix.

A general portrayal of demographic change in the age and sex distribution for the study area and its component parts can best be achieved by life cycle stage analysis. In this type of analysis, the age distributions are simply collapsed to broader age categories corresponding to the major turning points in the individual's life cycle:

1. The Childhood Years -	ages 0 - 14
2. The Youth Period -	ages 15 - 24
3. Early Maturity -	ages 25 - 44
4. Late Maturity -	ages 45 - 64
5. Retirement Period -	ages 65 and over

The Childhood stage of the life cycle represents the youngest dependent age group of the population from infancy to teenage years. Changes in this segment of the population will be brought about by fluctuations in fertility, infant and child mortality, and dependency loads of the migrating families. Table 3.5 shows the numerical and percentage distribution of the population for Cold Lake Study Area and its component parts in each of the life cycle stages. In terms of this dependent stage of the life cycle -- the childhood stage -- it will be noted that there have been proportional declines in the study area as a whole, as well as its constituent parts between 1961 and 1976. The Towns of Bonnyville and Grand Centre reveal overall numerical increases in the 0 to 14 year age group with the Town of Grand Centre indicating the greatest numerical increase with a growth from 632 to 865 in this age group. Of the three

Table 3.5 Population Trends by Life Cycle Stage, Cold Lake Study Area and Component Parts: 1961 - 1976.

Life Cycle Stages	Bonnyville				Cold Lake				Grand Centre			
	1961	1966	1971	1976	1961	1966	1971	1976	1961	1966	1971	1976
						Number						
0 - 14	630	840	825	825	527	538	455	415	632	670	720	865
15 - 24	265	322	430	515	223	216	270	230	268	332	385	510
25 - 44	394	496	515	610	352	327	330	400	399	472	665	915
45 - 64	240	305	400	495	149	156	190	195	159	203	225	370
65 and over	207	274	430	435	56	52	75	110	35	54	90	120
All Ages	1736	2237	2600	2880	1307	1289	1320	1350	1493	1731	2085	2780
						Percent						
0 - 14	36.3	37.6	31.8	28.6	40.3	41.7	34.4	30.8	42.3	38.7	34.5	31.1
15 - 24	15.3	14.4	16.5	17.9	17.1	16.8	20.5	17.0	18.0	19.2	18.5	18.3
25 - 44	22.7	22.2	19.8	21.2	26.9	25.4	25.0	29.6	26.7	27.3	31.9	33.0
45 - 64	13.8	13.6	15.4	17.2	11.4	12.1	14.4	14.4	10.7	11.7	10.8	13.3
65 and over	11.9	12.2	16.5	15.1	4.3	4.0	5.7	8.2	2.3	3.1	4.3	4.3
All Ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Statistics generated from data made available in Census of Canada enumeration area tabulations.

towns, Cold Lake registered a population decline in this age group from 527 to 415 which represents a 21.2 per cent decrease between 1961 and 1976. Both Bonnyville and Grand Centre manifested a 30.9 and 36.9 percentage increase in this population segment over the fifteen year period. For these two communities, this increase in the childhood segment of the population is likely the consequence of migrating families with dependent children into the area since the general fertility levels in both towns have experienced long-term declines.

Table 3.6 portrays the effective fertility ratios for the study area and its components at each census period. Relatively steady declines in fertility have been experienced by all communities in the Cold Lake resource area. These fertility declines are indicative of the broader trends in Canada. Since the peak fertility years of the 'baby boom', crude birth rates have been on the decline. The implication for smaller communities is that natural increase is not likely to play as important a role as it once did.

Long-term changes in this childhood segment of the population will have a demand impact upon various community services, particularly in the educational and preventative health sectors. For example, the decline in the childhood segment for Cold Lake will lessen the demand upon educational and health sectors and, conversely, the absolute numerical growth experienced by Bonnyville and Grand Centre will impose greater strains upon these same public sectors.

Closer examination of the age and sex distributions in the different communities and rural portion of the study area, as portrayed in the age-sex pyramids (see Appendix) over the fifteen year time period, will reveal a shrinking of the youngest age cohorts. This graphically shows the effect of the fertility declines as the communities make the transition from the higher fertility levels in 1961 to the lower fertility levels in 1976.

The second life cycle stage to review is the Youth period which encompasses the ages of 15 to 24 years. This is a critical stage in the life cycle since it covers the more important turning points in one's life span. This period of life would encompass the turbulent 'teen years'; it would include the secondary schooling stage of one's life; it is the most likely period for marriage and one's selection of occupation and career; it is a time for migration decisions often precipitated by career and educational goals; and finally, it will include the individual's first entry into the labour force.

Changes in this segment of the population will be contingent upon previous fertility (size of younger cohorts), migration, and to a lesser extent, mortality. The effects of migration upon the youth segment are worthy of examination. It is obvious that this segment of the population can increase through the in-migration of dependent populations, as well as young people seeking employment. The less obvious, but equally important, migration factor is the out-migration of young population from an area which will reduce the size of the population in this stage of the life cycle. When economic, educational, or personal development opportunities are lacking in a community, the result is usually an out-migration of young people. This out-migration would have implications for the future work force, as well as the population of childbearing age. Economic growth in a community would have the effect of holding the out-migration potential at a minimum.

In reviewing the changes in the Youth segment of the life cycle stage for the Cold Lake Study Area, it is noted in Table 3.5 that the Towns of Bonnyville and Grand Centre have evidenced numerical increases in this young age group representing a percentage change of 94.3 and 90.3, respectively, over the fifteen year period. While the Town of Cold Lake has remained relatively stable with regard to this age cohort, the rural portion of the study area registered a slight decline of one per cent. The sharpest quinquinnial increase was experienced by the Town of Grand Centre in the 1971 to 1976 period -- from 385 to 510, or a change of 32.5 per cent. Coupled with the increase in the Childhood segment of the population, it is evident that Grand Centre is the most 'youthful' community in the Cold Lake resource area. Grand Centre, perhaps, has the greatest potential for retaining its youthful population in light of these historical trends.

The major proportion of an area's population will be found in the Early and Late Maturity Stages of the life cycle, ages 25 to 64. Additions to this segment of the population would be from maturation and retention of younger populations and through migration; and losses through an increasing incidence of mortality with increasing age, as well as out-migration.

The early and late maturity stages of the life cycle encompass, to a large extent, the primary working ages of the population. It will be noted from Table 3.5 that the combined proportionate share that the 25 to 64 age group is of the total population for the total study area has increased from 37.8 per cent in 1961 to 42.0 per cent in 1976. This change in proportional share over the fifteen year period represents a 22.1 per cent increase. This increase reflects the net effect of declines in fertility which reduced the 1976 childhood age groups, and the retention of survivors from the earlier high fertility periods. In addition, one cannot discount the contribution of in-migration of population in the earlier maturity years, as well as survivorship due to improved mortality conditions over this period. It is difficult, however, with limited secondary census data to isolate the relative contributions of these various population growth sources.

It is noteworthy, that the Town of Grand Centre affirms its overall growth position in the resource area with marked increases in the early and late maturity populations. The early and late maturity segments in combination increased from 37.4 to 46.3 per cent in their proportionate share of the total age distribution. This represents a 130.3 per cent increase from 1961 to 1976. In contrast to the other communities, equally strong growth was experienced in both the early and late maturity stages by Grand Centre, with a 129.3 and 132.7 percentage increase, respectively.

The rural portion of MD 87 evidenced modest increases in the early and late maturity proportions between 1961 and 1976 largely due to the marked decline in the youngest population age groups. Absolute and percentage decreases, however, were registered over the fifteen year period for the early and late maturity populations with 12.8 and 9.1 percentage loss, respectively. Upon examination of the age distributions for the rural portion of MD 87, it is evident that a steady attrition in population has been experienced in every life cycle stage over the time period. Rural areas tend to lose population through out-migration of youthful populations in excess of any in-migration; mortality as a consequence of normal aging of the resident population; relocation of retired farm population and more recently, deficiency in replacing the younger age segments due to the current declines in fertility.

Since the early and late maturity stages approximate the working ages, it is appropriate to introduce the labour force activity experienced in the Cold Lake resource area over the fifteen year period. Table 3.7 portrays the labour force participation rates in the study area for 1961, 1971,

Table 3.7 Labour Force Activity by Sex, Cold Lake Study Area and Component Parts: 1961, 1971, and 1976.

Area	Participation Rate[a]			1961-1976 Percent Change[b]
	1961	1971	1976	
Alberta, both sexes	57.0	62.7	65.4	+ 77.7%
Total Study Area[1]				
Both Sexes	55.5	58.4	65.2	+ 36.7%
Males	76.9	74.4	78.1	+ 1.6%
Females	30.1	40.1	48.8	+263.8%
Bonnyville				
Both Sexes	49.8	48.6	54.0	+ 97.8%
Males	64.8	61.6	66.8	+ 91.8%
Females	35.3	38.4	33.2	+108.5%
Cold Lake				
Both Sexes	55.0	57.6	63.9	+ 34.0%
Males	78.4	79.3	79.3	+ 15.5%
Females	30.0	32.5	47.7	+ 85.8%
Grand Centre				
Both Sexes	59.2	64.9	68.8	+154.9%
Males	83.9	84.4	84.2	+102.5%
Females	29.5	43.2	53.2	+334.8%
Rural MD 87				
Both Sexes	56.3	61.0	69.4	+ 2.5%
Males	77.9	75.6	80.4	- 17.7%
Females	28.8	43.3	56.6	+ 71.8%

[1] Excludes Cold Lake Canadian Forces Base and Indian Reserves.

[a] Participation rate is the percentage the total labour force is of the population 15 years of age and over in the area.

[b] Percentage change between 1961 and 1976 in the number of labour force participants.

Source: Statistics generated from data made available in Census of Canada enumeration area tabulations and 1976. The labour force participants are defined as those persons employed or unemployed in the week prior to the census. The employed consisted of persons who worked for pay, or were self employed in a business, profession, or farm, or helped without pay in a family business or farm. The unemployed included those persons who were seeking work, on temporary lay-off, or who had definite arrangements to start a new job (Statistics Canada, 1978).

The labour force participation rate for both sexes increased from 1961 to 1976 in the Cold Lake resource area as a whole, as well as in its constituent parts. For both sexes, the Town of Grand Centre generated a 154.9 per cent increase in the number of labour force participants over the fifteen year period, with the Town of Bonnyville ranking second with an increase of 97.8 per cent. As will be noted in Table 3.7, the dramatic increase in the participation of females in the labour force contributed significantly to the overall participation rates in the resource area and its component parts. Male participation rates only yielded modest increases in each component from 1961 to 1976. The increased participation of females in the labour force in the resource area parallels the general trends for Canada over this period (Kalbach & McVey, 1979). Even the rural component revealed striking female labour force participation rates, however, it is suspected that this increase is somewhat artificial, in that farmer's wives were beginning to declare their assistance on the farm as employment for the first time during this period. Of more significance, is the general increase of female work activity in the communities which indicates not only an increased willingness to work, but also an increase in the creation of work opportunities for women in these communities. The greatest increase in female participation is revealed for the Town of Grand Centre with 334.8 per cent; and the Town of Bonnyville was ranked second with 108.5 per cent.

Since the relative proportions of elderly (65 years of age and over) and children (0 - 14 years of age) have a bearing on the economic viability of a community, it is worthwhile to utilize the dependency ratio to assess the relationship of the inactive or dependent population and active or working population. Table 3.8 portrays the dependency ratios for the Cold Lake resource area and component parts over the study period.

The Cold Lake resource area, as well as its component parts, experienced declines in the dependency ratios over the fifteen year period. As expected, the lowest dependency ratio of 54.9 was recorded for the Town of Grand Centre in 1976. This means that there were 54.9 persons in the dependent ages for every 100 persons in the working ages. The highest dependency ratios were found to be in the Town of Bonnyville for each census year. These high dependency ratios were influenced by the higher proportions of elderly populations (65 years of age and over) residing in the Town

Table 3.8 Dependency Ratios and Percentage Change, Cold Lake Study Area and Component Parts: 1961 - 1976.

Area	Dependency Ratios			
	1961	1966	1971	1976
Alberta	73.1	72.5	63.7	53.6
Total Study Area[1]	85.0	87.7	78.8	67.1
Bonnyville	93.1	99.2	93.3	77.8
Cold Lake	80.5	84.4	67.1	63.6
Grand Centre	80.8	71.9	63.5	54.9
Rural MD 87	84.8	89.3	81.6	69.3

	Percentage Change		
	1961-1966	1966-1971	1971-1976
Alberta	- 0.8	-12.1	-15.9
Total Study Area[1]	+ 3.2	-10.1	-13.3
Bonnyville	+ 6.6	- 5.9	-16.6
Cold Lake	+ 4.8	-20.5	- 5.2
Grand Centre	-11.0	-11.7	-13.5
Rural MD 87	+ 5.3	- 8.6	-15.1

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[1] Excludes Cold Lake Canadian Forces Base and Indian Reserves.

Source: Statistics generated from data made available in Census of Canada enumeration area tabulations.

of Bonnyville. Location of nursing home facilities in Bonnyville serves as an inducement for older populations to stay or retire to this community and, therefore, the dependency burden is likley to remain high relative to the other communities in the resource area.

The final life cycle stage concerns the Retirement years -- the population 65 years of age and over. It is expected that numerically this particular age group will increase over the years. This was found to be true for every component of the Cold Lake resource area with the exception of the rural component which revealed a decline from 417 in 1961 to 360 in 1976. (Table 3.5)

The retirement population makes up a significant proportion of the Town of Bonnyville's age distribution. In 1961, the aged comprised 11.9 per cent of the population and by 1976, this proportion had increased to 15.1 per cent. This represents a 110.1 per cent increase over the fifteen year period. If fertility continues to decline, thus decreasing the childhood segment of Bonnyville's population, it is expected that the aged proportion will continue to increase over the next several years. In-migration of retired farm population, as well as the continued improvement in longevity will have considerable bearing upon the future magnitude of this segment of the population. The rural portion of MD 87 was the only component to reflect a decline in retirement population over the fifteen year period. This decline can possibly be explained by the out-migration of retired farm population and mortality effects.

While the remaining communities of Cold Lake and Grand Centre did experience growth in absolute numbers of retirement populations, the proportions were somewhat attenuated because of shifts in other segments of the age distribution, e.g., the childhood and working age groups. It is important to recognize the relative shifts in the absolute numbers and proportions of these age groups, as the social and economic impact of the aged population in these areas may simply be unrecognized. The importance of this particular life cycle stage should not be under-estimated, in that this cohort requires age-specific types of housing, health care, and other community services.

3.6 Migration Status of the Population

Population mobility questions have only recently been included in the Census of Canada operations and, therefore, analysis of migration is restricted to 1971 and 1976 census years only. For analytical purposes, the several migration statuses have been grouped into two major categories. Accordingly, only the migrant and non-migrant populations within the Cold Lake resource area and its component parts are portrayed in Table 3.9. Migration status is pertinent only to the population five years of age and over.

The migrant population category includes those people whose mobility has taken them across major political

Table 3.9 Migration Status of the Population and Percentage Change, Cold Lake Study Area and Component Parts: 1971 and 1976.

Area	1971		1976		1971-1976 Percent Change[a]
	#	%[b]	#	%[b]	
Total Study Area[1]					
Migrants	3,155	28.3	3,580	28.3	+13.5
Non-Migrants	8,005	71.7	9,080	71.7	+13.4
Bonnyville					
Migrants	710	28.7	855	32.5	+20.4
Non-Migrants	1,760	71.3	1,780	67.5	+ 1.1
Cold Lake					
Migrants	465	38.0	470	39.0	+ 1.1
Non-Migrants	760	62.0	735	61.0	- 3.3
Grand Centre					
Migrants	985	49.9	1,245	51.6	+26.4
Non-Migrants	990	50.1	1,170	48.4	+18.2
Rural MD 87					
Migrants	995	18.1	1,010	15.8	+ 1.5
Non-Migrants	4,495	81.9	5,395	84.2	+20.0

[1] Excludes Cold Lake Canadian Forces Base and Indian Reserves.

[a] Percentage change between 1971 and 1976 in the number of migration participants

[b] Migration rate is the percentage of the total population, five years of age and over.

Source: Statistics generated from data made available in Census of Canada enumeration area tabulations.

boundaries, such as county, provincial, or international boundaries. In other words, the migrant population would include the intra-provincial and inter-provincial migrant, as well as the immigrant. In contrast, the non-migrant population includes the non-mover and mover, i.e., the person who had not changed residence since the previous census and the person who had changed residence but only within the same municipality (Statistics Canada, 1979: 35).

It is evident from Table 3.9 that both the Towns of Grand Centre and Bonnyville experienced an increase in the migrant population between 1971 and 1976 -- a percentage change of 26.4 and 20.4, respectively. Based on the foregoing analysis, it is suspected that Bonnyville's increase in migrants may largely be due to retired farm population whereas the increase in Grand Centre is likely due to economic opportunities. Cold Lake experienced the smallest number of migrants, as well as the lowest percentage increase over the five-year period. As expected, the largest proportion of non-migrants is found in the rural portion of MD 87 for both census periods representing an increase of 20.0 per cent between 1971 and 1976. Although unsupportable with the present census data, it is suggested that acreages and cottage settlements may account for a share of the migrant population into the rural portion of the study area.

3.7 Marital Status of the Population

The marital statuses include the never married, married, divorced, and widowed categories. The marital statuses are presented in Table 3.10 for the Cold Lake resource area. Separated status was included in the married status category for 1961, 1966, and 1971, but reported separately in 1976. The married status for 1976 has been adjusted to include the separated population to assure comparability. The percentages represented in the marital status table utilize the population fifteen years of age and over as the 'marital risk' population.

Two significant features are evident in the marital status data portrayed in Table 3.10. First, for all communities and the rural portion of MD 87 there has been a steady increase in the divorced population, with Grand Centre having the highest number -- fifty divorced people in 1976. The second salient feature is that the Town of Bonnyville reveals the highest proportion of widowed population in each census period. It is interesting to note that the widowed population has declined over the fifteen year period in the rural portion of MD 87. This is compatible with the assumption of higher mortality among the older populations of the rural sector, as well as the tendency for widowed populations to migrate from rural areas to nearby urban communities. The Town of Bonnyville may be the logical recipient of this type of migration.

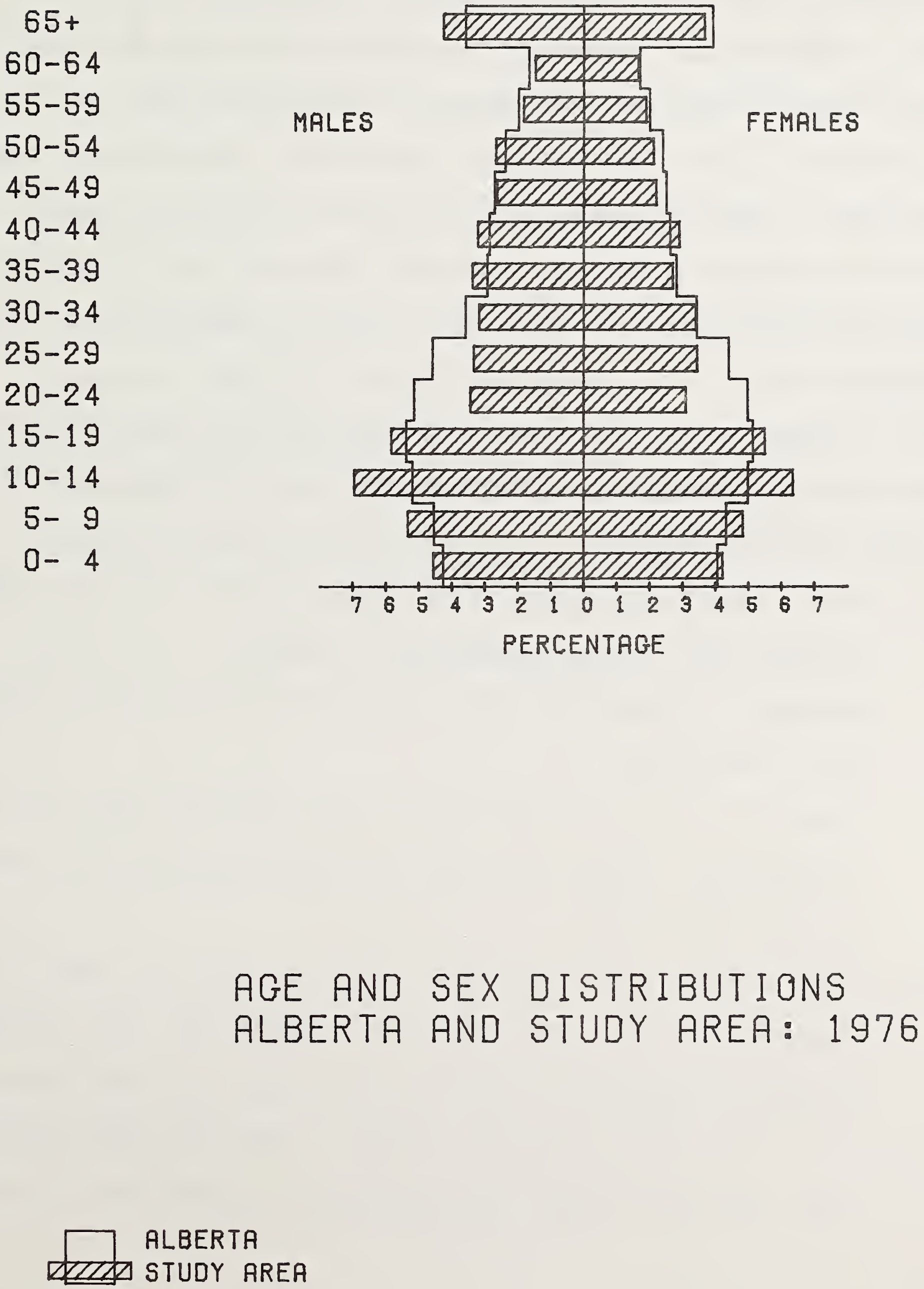
It may be noted that the Town of Grand Centre has the highest proportion of married population in each of the census periods. This may reflect the in-migration of families in the early maturity stage of the life cycle (see Table 3.5). Both the towns of Grand Centre and Bonnyville have evidenced a steady increase of married population over the fifteen year period which would be indicative of the economically more attractive environments in these two communities.

3.8 Concluding Remarks

This analysis has viewed the major life cycle stages of the population over a fifteen year time span for the Cold Lake resource area. As noted earlier, more detailed age-sex pyramids and data tabulations appear in the appendix for the resource area's component parts. The five figures that follow portray the age and sex distributions for the entire Cold Lake Study Area (Figures 3.1 through 3.4) for each census period and a comparative chart (Figure 3.5) which shows the change in the composition between 1961 and 1976. The Alberta age and sex distribution is utilized for comparative purposes in Figures 3.1 through 3.4 at each census interval.

The most notable feature in these age-sex pyramids is the effect of fertility declines on the youngest age cohorts. This shrinkage is revealed markedly in the 1971 and 1976 age and sex distributions (Figures 3.3 and 3.4). The importance of the Cold Lake resource area to retain a

Figure 3.4 Age and Sex Distributions



greater share of its younger population is rather obvious since the younger age groups are steadily reducing in size. This lack of replacement may have to be offset by an increase in migration in order to insure a steady, if not growing, labour force population.

Compositional changes in the age and sex distribution over the fifteen year period are even more evident in Figure 3.5. While the effects of fertility reduction are again evident, there is indication of increases in the early and late maturity stages (ages 25 - 54 particularly) and, of course, a pronounced increase in the proportion of aged population.

Drawing upon the foregoing analysis, it is evident that several key demographic patterns are important for the Cold Lake resource area:

1. Grand Centre and Bonnyville appear to be the most viable communities from a demographic viewpoint, in terms of population growth in the youth and working force ages of the life cycle.
2. Labour force participation in the resource area has been influenced largely by the increased activity of females in the work force.
3. The Town of Bonnyville will likely remain an attractive community for the retired population and widowed primarily because of existing services and facilities.
4. Fertility levels have declined in the Cold Lake resource area and the effect upon population growth will have to

be offset by in-migration.

5. It is evident that the divorced population in the Cold Lake communities will likely continue to increase as it has over the last fifteen years.
6. The dependency burden in the Towns of Grand Centre and Bonnyville is likely to conintue its downward trend.

The demographic changes, with regard to age and sex structure, fertility, migration, and labour force participation, within the Cold Lake resource area parallel those in Canada. With continued development in the petro-chemical sector, the demographic consequences for the resource area will be significant. The pattern revealed for the Town of Grand Centre over the last twenty years is evidence of the demographic consequences brought about by economic development.

4. GEOGRAPHIC MOBILITY AND POPULATION STABILITY

4.1 Introduction

Geographic mobility is necessarily one of the factors involved in the population growth that accompanies development. Migration, and the related phenomena of population stability and turnover, are important causes of social and economic change(Shaw,1975). In establishing a baseline for mobility in the study area, it should be remembered that geographic mobility is a way of life in Canada (Stone and fletcher,1977; Larson, 1979). Not all the mobility that is observed during or after the planned Imperial Oil development will be a product of changes introduced by the construction of the new plant. On the other hand, it is important to establish a baseline for geographic mobility, since this is one of the factors that is almost sure to change with development. Without the baseline, it would be difficult at best to ascertain to what degree development had influenced the residential stability of the study area. The present survey cannot directly estimate turnover. Since movers were of course no longer resident in the area at the time of the field work, only stayers were interviewed. The number of moves in the 5 years prior to the survey and the length of residence in the region are used to provide indirect inferences about turnover. A follow-up panel study of the respondents interviewed in the 1979 survey would be necessary in order to establish a pre-impact baseline for turnover.

Migration is important, therefore, as a life cycle event that allows us to construct a picture of change. Those people that moved to the area within a particular period (and stayed) form a synthetic migration cohort. The comparison of these cohorts allows inferences about selectivity in migration. The second use of such cohorts comes throughout the remainder of the report. Length of residence is used as an independent variable to examine "natural" maturational adjustment to life in the region, and possible anticipatory pre-impact development.

Place of origin is examined by province , size of place, and length of stay there. This analysis includes retrospective information gathered describing where respondents were born, where they grew up, and where they lived prior to moving to the Cold Lake region.

Geographic mobility was measured as the number of moves between places in the five years prior to the survey. Stability was measured as the number of years of residence in the study area.[3] Analysis of selectivity in migration has found that those from urban backgrounds have higher mobility, and lower stability (Shaw,1975). Immigrants generally are more mobile than non-immigrants and those with higher education are more mobile (Stone and Fletcher,1977). Males usually have higher mobility than females, and the married are more stable than those with other marital statuses, except perhaps for the widowed (Shaw,1975; George,1970; 1976; Kalbach and McVey,1979). These differences have also generally been noted in studies of resource communities (Jackson and Poushinsky, 1971; Lucas, 1971; Riffel; 1976; Matthiasson, 1970; MacMillan et al., 1974). Those who live in resource communities that have experienced high rates of growth often exhibit much higher rates of mobility than the general population, even when demographic differences are taken into account (Gartrell et al., 1980). Finally, those who move a relatively short distance usually exhibit higher stability of residence (Shaw, 1975). Respondents to the survey who were raised in Alberta, or who moved to the study area from within Alberta would be expected to show lower geographic mobility and higher stability than respondents who moved to the Cold Lake region from further away.

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[3] This measure was constructed from responses as to the month and year in which the respondent moved to the region.

Results of the 1979 survey of the Cold Lake region showed that, as expected, residents of the study area exhibited high stability. Fully 20.7% of the adults (age 18 and over) in the 1979 Cold Lake Baseline survey had always lived in the area. Even among those who had moved to the area, length of residence in the place where they grew up was high, averaging 24.6 years. No matter where they came from, less than 7% had lived there shorter than 10 years. Only about 16% could be characterized as frequent movers in these terms (less than two years residence in the place previous to their present residence in the Cold Lake region).

4.2 Place of Origin

About 31% of the sample grew up in a rural area and 64% grew up in a small town. Only 5% grew up in a city. Of the migrants to the region, 21% came from rural areas, 42% from small towns, and 37% from cities. By and large, most people in the study area had grown up in the area itself, or in places similar to it. By way of comparison, Fort McMurray's migrants have come primarily from urban places. About 52% came from cities, 41% from small towns, and only 7% from rural areas.

Among the general sample in the study area, 48% were born in Alberta. Even among those not born in the study area, 39% grew up in Alberta. and 39% of the migrants moved to the Cold Lake region from other places in Alberta (Table 4.1). Compared to boom towns such as Fort McMurray, a relatively higher proportion of the residents of the study area were "home grown". In Fort McMurray only 3 adults out of a sample of 430 were born in the town, 30% grew up in Alberta, and 41% had lived in Alberta prior to moving to Fort McMurray. [4]

About 23% of the sample were born in one of the other western provinces (Table 4.2). About 16% were immigrants to Canada, a figure similar to the 17% found for Fort McMurray

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[4] This latter percentage may be somewhat inflated by the tendency to use places like Edmonton as a "staging" area in hiring.

Table 4.1 Place of Origin by Locale[1]

Locale	N	Always lived in the Cold Lake region	Alberta born	Grew up in Alberta	Moved to region from Alberta[2]
		Percent			
Cold Lake	158	9.2	36.9	49.2	43.2
Grand Centre	206	7.4	31.7	38.1	27.8
Bonnyville	280	21.5	50.3	63.8	59.7
Rural farm	191	44.8	68.8	78.8	67.0
Rural non-farm	105	17.8	49.3	66.8	58.3
Total	940	20.7	47.7	59.1	49.2
η^2		.110	.068	.085	.084
Sig. Level		.001	.001	.001	.001

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[1] For the one-way analysis of variance, all four indicators of place of origin are represented by dummy variables using binary coding. Eta squared (^{2}) is the squared non-linear correlation coefficient. Sig. level refers to the probability that the differences observed happened by chance under the null hypothesis that no differences exist in the population.

[2] This includes those who migrated to the Cold Lake region (N=746).

Table 4.2 Place of Origin

Place	Born	Grew up	Previous to Cold Lake region
	Percent		
Alberta	47.7	38.5	39.1
B.C.	3.9	3.6	5.7
Manitoba	3.2	3.1	2.7
N.B.	1.4	1.2	0.6
Nfld.	0.3	0.3	0.1
N.S.	1.5	1.1	2.0
Ontario	5.5	5.0	6.0
P.E.I.	.2	0.4	0.2
Quebec	3.8	2.7	2.7
Sask.	15.8	12.8	9.6
N.W.T.	0.3	0.2	0.9
Yukon	0.0	0.0	0.1
U.S.A.	2.8	1.4	1.5
Other	13.2	8.2	8.1
No One place	---	0.5	---
N.R.	0.4	0.4	20.7[1]

[1] Non-response includes the 194 (20.7) respondents who were born in the Cold Lake region and for whom the question of place of residence previous to moving to the study area was not applicable.

(Gartrell et al., 1980).[5] About 3% were born in the Maritimes, 6% in Ontario, and 4% in Quebec. With respect to where respondents were raised, 20% grew up in B.C., Manitoba or Saskatchewan. In addition 18% of the sample moved to the study area from one of those provinces. This was only slightly higher than comparable figures for Fort McMurray.[6] Relatively few migrants came from Quebec to either Fort McMurray or to the Cold Lake region, but far more came from the Maritimes and Ontario to Fort McMurray than came to the study area.

The general population of the study area (CFB , Metis and Indians are treated in separate special population reports) was divided into five different areas in order to examine differences within the region: the three towns of Bonnyville, Grand Centre, and Cold Lake; the rural farm population; and the rural non-farm population. The rural farm population had the highest percentage of respondents who were born in the Cold Lake region (Table 4.1). This sub-sample had the highest proportion of Alberta-born and it also had the highest proportion of those who grew up in the study area, and the highest proportion of those who, if they moved to the Cold Lake region, did so from within Alberta. Bonnyville and the rural non-farm sub-samples showed relatively high proportions of people born in the region.

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[5] This is similar to Canada in 1971. For the country as a whole about 15% were immigrants (Kalbach and McVey, 1979:119).

[6] These figures were 18% for those who grew up in the west (outside Alberta) and 16% for those who moved to Fort McMurray from the west outside Alberta.

These two sub-samples also had relatively high proportions of people raised in Alberta, or who migrated from this area from Alberta. Cold lake and Grand Centre, perhaps because of their recent growth in response to the development of CFB Cold Lake, had a lower proportion of residents who were born in the study area, or who grew up in or were from Alberta if they migrated to the area. [7]

Among migrants to the area, 49% had moved to the Cold Lake region from Alberta. This is only slightly greater than comparable figures (41%) estimated for Fort McMurray (Gartrell et al., 1980). As was the case with place of origin for other mobility indicators, the rural farm population exhibited the highest proportion of migrants from Alberta. Bonnyville and the rural non-farm population exhibited the highest proportion of migrants (60% and 58%, respectively), Cold Lake had 43%, and Grand Centre had only 28%.

To summarize, it appears that Cold Lake and, particularly Grand Centre had relatively low proportions of people born in the Cold Lake region. A high proportion of the migrants to those areas, particularly to Grand Centre, were from outside the Province of Alberta. These results probably reflect the continued influence of CFB Cold Lake. A number of service personnel live off the base, and CFB continues to employ a large civilian labour force. The town of Grand Centre thus attracts a higher proportion of migrants from outside Alberta.

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[7] Differences between sub-samples within the study area explained 11% of the variation in percentage of population born in the region (Table 4.1). Differences in locale explained 6.8% of the variation in the percentage of Alberta-born, 8.5% of the variation in the percentage who grew up in Alberta, and 8.4% of the variation in the percentage of migrants who moved to the study area from Alberta.

The relatively high place stability of the rural farm population ignores out-migration from the area, and the high place stability in Bonnyville and among the rural non-farm population is perhaps accounted for by migration from the rural areas to more urban areas.

4.3 Geographic Mobility

Residents of the Cold Lake region appeared to have higher than average mobility when compared to Canada as a whole. About 60% of the residents of the Cold Lake region had not moved between places in the five years prior to the survey. The comparable figure for Canada (1971) was 53% (Kalbach and McVey, 1979). Among the 40% who had moved in the study area, 18% had made just one move, 15% had made two or three moves, and 7% had made four or more moves. The average number of moves in the previous five years was 0.97 with a standard deviation of 2.04. While this represented a level of geographic mobility that was somewhat higher than that for Canada, it was significantly lower than that exhibited by the population of Fort McMurray at about the same time. Only 18% of the Fort McMurray sample had not moved between places within the five years prior to 1979, and the average number of moves per person (2.04) was twice as great as corresponding figures for the Cold Lake region.

Differences by locale within the study area were significant ($p<.001$), accounting for 4.5% of the variance in the number of moves. The rural farm population averaged the lowest number of moves (0.21), and Bonnyville residents also reported a relatively low level of mobility (0.89). Residents of the other three areas all reported substantially higher past mobility. Those from the rural non-farm segment of the population averaged 1.23 moves and those who lived in Grand Centre averaged 1.26. Residents of Cold Lake had the highest level of geographic mobility with an average of 1.47 moves in the five years prior to the survey.

4.3.1 Selectivity in Mobility

There were not significant differences between males (averaging 1.0) and females (averaging 0.88) in the number of moves within the past five years. There were, however, significant differences by age. Those under 25 years of age averaged 2.19 moves. The 25-35 cohort averaged 1.6, and the 35-45 cohort averaged 0.68. For those 45-55 the average number of moves was 0.46, while for those 55-64 the average was 0.20, dropping only to 0.19 for those 65 and over. Geographic mobility decreased as age increased.[8]

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[8] Using a linear model, age explained 11.1% of the variation in number of moves. The non-linear components of the relationship were also signficant ($p<.01$), but since eta-squared was .128, they were relatively minor.

Marital status differences in geographic mobility were significant (p<.001). Other than the widowed, the married were the most stable (0.84). Never-married respondents averaged 1.89 moves. Those who had been born in Alberta had moved less often than those who were born outside the province (0.63 versus 1.27), and those who grew up in Alberta had moved often as well. Migrants who came from rural areas had moved less often than those from small towns or urban areas.

The higher the level of education completed by the respondent, the higher the number of moves he or she reported. Those with 6 years or less of completed education averaged 0.31 moves, while those with 17 years or more averaged 2.13 moves. However, there were not significant differences between those of different ethnic or religious statuses. Overall, differences between age cohorts were larger than those for any other selection factor. As people grown older, they settle down and move less frequently as a natural part of the normal life cycle.

4.4 Population Stability

4.4.1 Length of Residence

Results for population stability confirm those for number of moves within the past five years. The average length of residence in the study area was 20.6 years, indicating high population stability. About 10% of the adults sampled had moved into the region within the year prior to the survey (between fall 1978 and fall 1979). A further 6% had moved into the area between the fall of 1977 and the fall of 1978 (Table 4.3). An additional 15% had moved into the region between 1974 and 1977.[9]

Over one-half of the sample had lived in the region longer than 10 years, and over 20% lived in the region before WWII. Population stability was much greater than that observed in Fort McMurray in 1979, even though this represented a relatively stable period for Fort McMurray. Differences were even larger when the Cold Lake baseline survey was compared to Fort McMurray in 1969.[10]

4.4.2 Length of Residence by Locale

The general sample of the Cold Lake region exhibited high stability (averaging 21 years), but there was considerable variation within the study area. Not surprisingly, rural farm residents reported the longest average length of residence within the region (30 years). This was followed by rural non-farm residents who averaged 23 years, and residents of Bonnyville, who averaged 22.8

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[9] Some of the mobility reported as moves between places may have been within the study area, since it contains several distinct towns and several villages. The proportion of people who had lived in the region for over five years (69.2%) is somewhat higher than the proportion reporting no moves between places within the five years prior to the survey (60%).

[10] Fort McMurray in 1979 had greater population stability than it did in 1969, despite the construction of Syncrude between 1973 and 1978 (Gartrell et al., 1980). Comparing 1969 and 1979, it appeared that there were about the same proportion of new migrants to the town, but there was a higher proportion of long-term residents and a lower proportion of medium-term residents.

Table 4.3 Population Stability: Years Residence for the Cold Lake Region, Fort McMurray and Edmonton

Years Residence	Cold Lake region (1979)	Fort McMurray 1969	Fort McMurray 1979	Edmonton 1979
	Percent			
Less than .34	4.4	15.0	13.0	0.7
.34 - 1.00	5.6	13.2	15.8	3.6
1.0 - 2.0	5.8	23.3	23.0	4.1
2.0 - 4.5	13.6	36.0	25.6	13.7
4.5 - 10	15.2	4.9	15.3	14.1
10 and over	55.5	7.6	6.9	63.8
N	940	451	418	439

years. Those who lived in the newer towns of Cold Lake and Grand Centre averaged shorter length of residence in the region (15.3 and 11.8 years respectively). Differences between these five sub-samples accounted for 10.9% of the variation in length of residence within the study area(p<.001).

4.4.3 Socio-demographic Differences in Stability

Males had lived in the region longer than females, but the differences were not significant (p>.05). Married respondents had lived in the area longer (21 years) than the never-married (16 years) , although the widowed (averaging 36.3 years) had lived in the region longer than those with other marital statuses. Contrary to predictions, household size had significant negative effects on stability. The larger the household, the shorter the length of residence within the region. One-member households averaged 25.5 years. Two and three person households averaged only slightly shorter residence (24.5 and 21.9 years, respectively), but there was a decrease in stablity for those with four members or five or more (14.6 years and 17 years, respectively). [11]

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[11] While some of these effects may be created by mixing never-married and widowed respondents in the one-member household category, this line of reasoning would not explain the difference between two or three member households and those with more members. Some of this difference may be a by-product of normal maturational differences, since older couples would tend to be in a situation where their children had left home.

Respondents who had been born in Alberta reported significantly higher stability (25 years) than those who had been born elsewhere (16.7 years). This difference was even larger for those who grew up in Alberta (25.1 years) and those who did not (14.2 years). Excluding those who were born in the Cold Lake region, those who grew up in rural areas had lived in the Cold Lake region considerably longer than those who grew up in small towns (21.4 compared to 12.7 years), or cities (8.9 years) . Differences were similar (but smaller) for size of place before moving to the Cold Lake region. Differences in place size (growing up) accounted for 15.5% of the variation in length of residence.

There were smaller, but significant differences between those who identified themselves as having French ethnic status (26.2) compared to others (19.3). More detailed analysis showed that respondents of Polish decent averaged 31.6 years of residence, and those of Ukranian origins averaged 28.6 years. [12] Those who indicated that they were Roman Catholics averaged 23.3 years of residence (versus all others at 19.1 years). Greek Orthodox (36.7), Pentecostal (32), and Ukranian Catholic (30.5) averaged the longest residence in the study area.

There were marked difference in length of residence by both education and age. As expected, higher education and lower age were both associated with shorter residence in the study area. Length of residence decreased monotonically from 37.6 years for those with 0-6 years of education, to 7.3 years for those with 17 of more years of education. This linear trend accounted for about 22.3% of the variation in length of residence. Such effects are not unusual, since those with higher education are generally more geographically mobile (Kalbach and McVey, 1979). They are, nevertheless, partially the result of corresponding age differences (Figure 4.1). Since educational opportunities have increased greatly in the past several decades, age was strongly negatively correlated with education ($r=-.526$, $p<.001$). Length of residence is also highly dependent on age. As illustrated in Figure 4.1, the older the respondent, the longer he or she had lived in the region. The correlation between these two indicators was large and significant ($r^2=.408, p<.001$). There were no increases over the youngest three cohorts (age 18 through 29.99). This may reflect out-migration of young adults and in-migration of others. For those 30 years and older, increases in years resident were linear with increases in age.[13] While this kind of data allows only indirect inferences about turnover, it appears to be much greater for those under 30 years of age. There appears to be relatively little outmigration after that point. Again, this represents the expected life-cycle changes for a small-town, rural area.

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[12] There were only 8 Metis and 6 native Indians interviewed in the general sample of the area. This constitutes too small a sub-sample to permit separate analysis.

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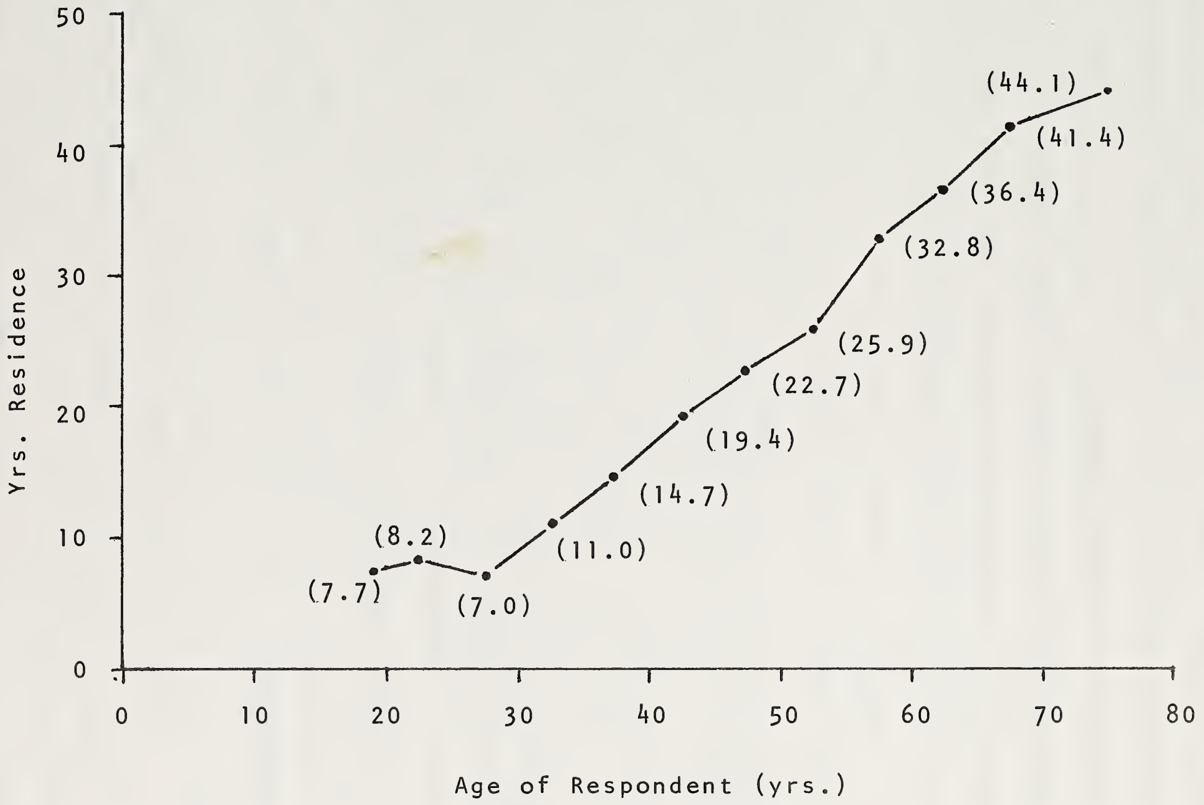
[13] The slope of this linear fit was only moderately lower than 1.00. One-way analysis of variance results showed that non-linear effects were not significant ($p>.05$).

Figure 4.1 Length of Residence in the Cold Lake Region and Age of Respondent.



In order to examine the independent effects of each of these many factors, multiple regression analysis was performed using length of residence as the dependent variable. Socio-demographic and social background characteristics were used as the predictors (Table 4.4). The partial regression slope for age (b=0.564) was somewhat reduced from the simple slope of 0.737.

Beyond the effects which age had on length of residence in the region, several social origin factors had significant positive effects on stability. Being born in Alberta and growing up within the province, higher stability wherever one grew up, and growing up in a less urban area (similar to the Cold Lake region) all had a positive influence on stability. With the influx of new migrants to the area expected with the development of Imperial Oil's Cold Lake project, there may be a change in the in-migration stream to a higher proportion of people from outside the province of Alberta, and a higher proportion of those from urban backgrounds. This could have a negative effect on long term population stability within the area.

Education and household size had significant negative effects on length of residence, even when age and background factors were controlled. The higher the education and the larger the size of the household, the shorter the length of residence in the region. Roman Catholics had lived in the area longer, as had those who lived in single family dwellings.

Even after all those social and demographic effects had been taken into account, those who were rural farm residents at the time of the interview had lived in the area over five years longer than other residents. Differences between other areas in average length of residence appeared to be a consequence of the social backgrounds and demographic composition of the population. [14]

4.5 Mobility Intentions

Respondents were asked how long they intended to stay when they first moved to the Cold lake region. While this question was appropriate only for those not born in the study area, all respondents were also asked their future mobility intentions. Results (Table 4.5) provide some indication of possible turnover as predicted by the residents themselves.

A relatively high proportion (67%) of the migrants to the Cold Lake region who stayed at least until the fall of 1979 initially planned to make the area their permanent home. About 75% currently planned to do the same. Residents themselves expected their turnover to be relatively low. This is interesting given the wide-spread knowledge of the

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[14] There were several other variables that did not have significant effects on length of residence when variables reported in Table 4.4 were controlled. Home ownership, ethnic status (French), sex of respondent, immigrant status, and marital status were included as possible predictors, but were omitted from the reduced form equation reported in Table 4.4. Differences between Bonnyville and the rural non-farm population appeared to be largely a function of age.

Table 4.5 Mobility Intentions: Cold Lake (1979) and Fort McMurray (1969, 1979).

Place and time of estimation of stay	Yrs. planned to stay[1] 1 or less	1-2	3-4	5-10	Over 10	N
	Percent					
Cold Lake region						
On arrival	7.1	7.2	9.5	10.5	66.7	595
At interview	7.1	4.9	4.6	8.7	74.7	776
Fort McMurray						
On arrival						
1969	12.4	12.2	15.7	10.2	49.4	451
1979	18.4	19.7	8.1	13.1	41.7	381
At interview						
1969	27.9	14.4	18.2	16.7	22.9	402
1979	9.6	8.2	22.1	11.7	48.4	366

[1] Categories for years planned to stay are matched to those of Matthiasson's 1969 survey (Matthiasson,1970). Continuous data for the 1979 AOSERP Fort McMurray survey and the 1979 Cold Lake Baseline were rounded to the nearest year. The category "over 10" includes "forever", "for good", "always", and similar responses. "Don't know" responses are omitted from the analysis. Figures also omit those who had always lived in the region from intentions "on arrival".

proposed development and its probable impact.

Just how low respondents predicted their future turnover to be is demonstrated by comparisons with survey estimates for the same indicators in Fort McMurray in 1969 and 1979.[15] The pre-impact mobility intentions of the population of the Cold Lake region showed higher stability than Fort McMurray in 1979. This was true of both retrospectively reported intentions on arrival, and intentions at the time of the interview. People were more likely to move to the Cold Lake region with the intention of making it a permanent home, and once they were there, they were more likely to intend to stay.[16]

4.6 Summary

Just as it is elsewhere in Canada, geographic mobility is an important and "normal" event in the life cycle of residents in the pre-impact population of the Cold Lake region, Survey estimates showed that 21% of the adult population of the study area were born in the region. On the average, residents had lived in the Cold Lake region for 21 years, and less than one-sixth of the population could be classified as relatively recent migrants to the area (less than 2 years residence).

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[15] If anything, the populations present in Fort McMurray at those two times would be relatively permanent, since both 1969 and 1979 represented periods after major contruction was completed and the plants (Suncor and Syncrude, respectively) were in operation. For Fort McMurray, a significantly higher proportion ($p<001$) of the 1979 sample intended to make Fort McMurray a permanent home. In that sense, the population had stabilized over the decade (Gartrell et al., 1980).

[16] All three surveys include only stayers (those resident in the respective communities at the time of the interview). While such samples provide suitable estimates of population stability at one point in time, they do not directly address the problem of turnover.

Residents of the study area had slightly higher geographic mobility than Canada as a whole, particularly given the small-town, rural nature of the Cold Lake region. This is probably attributable to the lower stability of the population of Grand Centre, where a high proportion of the labour force is employed by the Department of National Defence.

Most of the people in the region grew up in either small towns or rural areas (similar to the region itself), and about one-half of the residents were born in Alberta. Of the migrants to the area, about one-half lived in Alberta before moving to the Cold Lake region. Slightly less than one-quarter of the migrants came from other western provinces, and relatively few came from Ontario, Quebec, or the Maritimes.

The population of the study area was far more stable than that of Fort McMurray. While the study area had a far higher proportion of residents who had been born in the area, among its migrants about the same proportion came from within Alberta as came to Fort McMurray. The Cold Lake region also had a much lower proportion of former residents of Ontario and the Maritime provinces. Although the proportion of immigrants (16%) to Canada was similar to that found in Fort McMurray, neither area appeared to be atypical in attracting immigrants.

Within the study area, the rural farm population was the most stable group. It had the highest proportion born in the area, the highest proportion who grew up in Alberta, and the highest proportion who moved to the region from Alberta. The urban areas were lower on all these counts, with Grand Centre consistently exhibiting the lowest stability. A relatively high proportion of the migrants to Grand Centre came from outisde the province, probably because of the high rate of employment by the Department of National Defence .

Mobility was higher among the young, the highly educated, the never-married, and among those who came from outside Alberta. Turnover appeared to be relatively high for those under 30 years of age. What evidence there was suggested that it was much lower for those over 30. Contrary to predictions, those with larger households had lower stability. This was a result both of the high proportion of widowed respondents and those respondents whose children had left home.

Higher migration to the area of young, highly educated, single people from outside the province would probably decrease the stability within the region. By and large, most respondents themselves (75%) intended to make the area a permanent home. Despite any negative consequences that residents might perceive to be possible if development went ahead, most planned to stay.

5. OCCUPATIONS AND INCOMES

5.1 Introduction

A socio-economic portrait of the Cold Lake study area requires a detailed examination of both the structure of "work" and the financial and psychological rewards of employment. There are few available sources for such information, as other researchers have noted (Resource Management Consultants, 1978:35). Consequently, a large-sample survey of area residents can be very useful.

As with other topics discussed in this report, the primary purpose is to present a baseline description of occupational and income characteristics of the area. Previous intrusions into this rural area by the larger urban world (e.g. the construction of CFB Cold Lake) have left their mark on the occupational and industrial profile of the area, but so have general processes of social change in the country as a whole. It is difficult, therefore, to isolate clearly the social and economic costs and benefits to the area of the presence of the military base. The changes which the proposed Esso Resources plant will incur can be better mapped with the aid of a systematic pre-impact survey of work and income characteristics of the study area.

A variety of topics are discussed in this chapter, although all of them are, in some way, related to working and "making a living". A discussion of labour force participation rates precedes an examination of the work histories of current residents of the study area. Occupational and industrial profiles of the study area and its component parts are then provided along with a separate discussion of farms and farmers in the study area. Following these attempts to document the pre-impact occupational and industrial structures of the area, are relatively detailed descriptions of the incomes and fringe benefits received by study area respondents and the standards of living and debts they maintain.

5.2 Labour Force Participation

As noted in chapter 3, labour force participation rates have increased in Cold Lake, Grand Centre, Bonnyville and the rural portions of the study area, for both sexes, from 1961 to 1976. The total increase over time has been largely a product of increased participation in the labour force reported by women, even in the rural parts of the study area.

Of all the respondents in this 1979 survey (N = 940), 284 (30.2%) had not worked at all, either full-time or part-time, in the year previous to the interview. Almost one-half of the sample (N = 455; 48.4%) were employed full-time when interviewed, while a further 70 respondents (7.4%) were working on a part-time basis. Those currently not employed (but who had been active in the labour force in the previous year) made up the remaining 13.8% of the sample (N = 130).

Assuming that all of the 130 respondents currently not employed were available for work, the combination of full-time employed, part-time employed and unemployed comprises 69.6% of the sample. The unadjusted labour force participation rate for Alberta in October of 1979 (when the interviews were completed) was 69.9%, suggesting that the study area closely resembles the rest of the province. However, the provincial rate is based on all residents 15 years of age and older whereas all survey respondents were 18 or older. Inclusion of younger respondents (who are more likely to be in school than in the labour force) would lower the survey estimate as would exclusion of those of the 130 unemployed who were not seeking work. In brief, survey estimates suggest that the area's labour force participation rate is lower than the provincial average.

Throughout this chapter the major employment status distinction used is simply whether or not the respondent was employed full-time when interviewed. Thus, the 455 (48.4% of the total) who were employed full-time frequently comprise the analysis sample. This percentage does not, of course, include the special populations described in other volumes of this report. Only 26.4% of the respondents in the two Metis settlements had full-time jobs, demonstrating substantial disparity in employment opportunities within the study area.

5.2.1 Area Differences

Because average ages differ considerably between communities within the study area, we might expect that the percentage of respondents employed full-time would also vary acccordingly. Comparisons of community totals in Table 5.1 demonstrate substantial differences. In Grand Centre, 64% of the respondents reported full-time employment. Cold Lake (52%) and the rural farm areas (49%) were similar in this respect, while Bonnyville (41%) and the rural non-farm area (31%) had the lowest full-time employment rates. The magnitude of the locale differences are best demonstrated by the fact that the rate in Grand Centre is more than twice as large as the rural non-farm rate.

A heavy oil plant near Cold Lake will attract many new residents to the study area. To the extent that new residents settle near the site of the proposed oil plant (i.e. in Cold Lake and Grand Centre), the employment rate difference between Bonnyville and rural non-farm areas, and the Cold Lake-Grand Centre area, may be increased.

5.2.2 Sex Differences

In both Cold Lake and Grand Centre, the full-time employment rate for men is at least twice as large as the rate for women (Table 5.1). In Bonnyville and the rural non-farm portion of the study area, male rates are one and one-half to two times as large as female rates. This lower sex difference is not a result of higher participation rates for women in Bonnyville and the rural non-farm area. Instead, because average ages are higher in these areas, larger proportions of men are no longer in the labour force.

The largest sex difference in reported full-time employment rates is among rural farm respondents. Eighty-six percent of the rural farm male respondents reported being employed full-time compared to only 20% of female respondents in this group. This large difference in farming households may be an over-estimate since some women may not consider their labour contribution on the farm as employment in a formal sense. Accepting this "reported" difference, however, in combination with the sex differences in the other four study area locales, produces a total male full-time employment rate for the study area of 72.5% (N = 405). Of all the women in the sample (N = 535), 30.4% reported being employed full-time when interviewed.

5.2.3 Age Differences

Full-time employment rate differences by locale have been explained as a partial function of age: in communities and areas with older respondents, labour force participation rates are lower. A clear demonstration of this relationship between age and the probability of full-time employment is presented in Figure 5.1.

Only 48% of the respondents under 22 years of age reported full-time employment while between 55% and 67% of those in the six age cohorts between age 22 and 55 said they were working full-time. The highest rate (67%) was for those aged 36 to 40. The lower employment rate for the very young is a phenomenon not peculiar to the study area. The young are the group most affected by job shortages throughout the country. For example, in 1977 the national unemployment rate (both sexes) for those 15 to 24 years of age was 14.5%. The comparable figure for those 25 years old and over was 5.8% (Statistics Canada,1980:90).

The full-time employment rate drops dramatically for the last two age cohorts. Only 37% of those aged 56 to 65 were working at a full-time job. This pre-retirement reduction is a function of the relatively few women in this age group who are active in the labour force. Considering only men aged 56 to 65, the full-time employment rate is 68%. Only 13% of the women in this age cohort reported full-time jobs. The very low rate (6%) for post-retirement age respondents is, obviously, not unusual.

What makes the study area population different from the Canadian or provincial population (but not necessarily other rural populations) is the larger proportion of elderly residents. This proportion will be reduced as development proceeds and attracts younger residents. A post-impact survey might not generate a full-time employment by age curve much different from Figure 5.1. What will be different will be the proportion of area residents represented by each of the plotted age categories.

5.2.4 Dual Career Families

Again, because of the age distribution of the study area population, we find relatively few households where both adults are employed full-time. One hundred and ninety of the 727 married or common-law respondents reported both themselves and their spouse working full-time. This represents 26.1% of these households or 20.2% of all 940 households in the sample.

The proportion of dual-career households of all households was highest in Grand Centre (32%) as would be expected since this town has the highest proportion of women reporting full-time employment (Table 5.1). In Cold Lake, 23% of the households fit into this category. The percentages for Bonnyville (16%), rural non-farm (17%) and rural farm respondents (13%) are considerably lower.

The number of families with both spouses employed will probably increase as the age composition of the study area is altered by petroleum-based development, assuming that jobs are available for women who are seeking employment. Comparison with 1979 AOSERP survey results from Fort McMurray allow a crude estimate of the size of the expected increase. In that community, 122 of the 324 married/common law respondents (37.7%) reported full-time employment for both themselves and their spouses (Gartrell et al., 1980). However, since the Cold Lake study area now contains more elderly residents than did Fort McMurray before the oil sands development, it may be some time before the proportion of dual-career families in the Cold Lake area approaches that in Fort McMurray.

5.3 Work Histories of Study Area Residents

5.3.1 Patterns of Employment Stability

Although less than 50% of the 940 respondents were employed full-time when interviewed, 865 (92%) had, at some point, held a full-time job. Twenty percent of the total had held only this one job, 20% reported a total of two full-time jobs, and 15% reported three jobs. The remaining 37% had worked at four or more full-time jobs during their working career. The average number of full-time jobs held, for the total sample, was 3.60. Sample members had held an average of 1.79 jobs within the Cold Lake study area.

The total sample reported being unemployed (out of work and looking for work) an average of 1.28 times in their working careers. Sixty-two percent had never been unemployed (by this definition), and a further 18% reported only one period of unemployment. Men were more likely to have experienced periods of unemployment (average = 2.00 times) than were women (average = 0.74 times), but there were no statistically significant differences ($p > .01$) by age in frequency of unemployment.

A comparison with responses to these two questions from the 430 respondents of the 1979 AOSERP study of Fort McMurray would be instructive. The total sample in that survey reported an average of 4.63 full-time jobs and 1.87

periods of unemployment (Gartrell et al., 1980). Fort McMurray residents exhibit a considerably higher level of employment instability than do residents of the Cold Lake study area, despite the substantially lower average age of the former group. If age-specific rates were compared, differences in levels of employment stability would be even larger.

A more detailed analysis of the Fort McMurray data revealed that young males without post-secondary educations had the highest record of employment instability (Gartrell et al., 1980). This is the group of relatively transient workers which growth centres tend to attract. If and when the Esso Resources construction phase begins, the Cold Lake region will also become attractive to such workers.

5.3.2 Recent Job Histories

Considering all members of the sample, respondents had worked full-time an average of 6.52 months in the year before their interview. A complete twelve months of full-time work was reported by 385 respondents (45% of the total), while 330 (38%) had not worked full-time at all in the previous twelve months.

Eighty percent of the sample (N = 752) had not worked at a part-time job in the previous year while 6% (N = 59) had held a part-time job for the full year. This results in an average of 1.29 months part-time work in the previous year for the total sample.

The currently employed (full-time) members of the sample had held their present job for an average of 6.37 years. This average conceals some large differences by locale within the study area. Cold Lake, Grand Centre and Bonnyville residents who were employed full-time when interviewed had spent relatively short times on their jobs (averages of 3.47, 3.81 and 3.91 years). Rural non-farm (employed) respondents reported an average of 6.77 years, a value high compared to the three towns in the area but low compared to rural farm respondents (average = 15.76 years). Farmers are much more likely than all other occupational groups in the area to have been working at their job for a long time.

5.3.3 Looking for Work

Fourteen percent of the total sample had looked for a full-time job in the year before being interviewed (Table 5.2). Those who were employed full-time when interviewed were no less likely but, instead, more likely to have looked for a full-time job. Ten percent of those not in the labour force compared to eighteen percent of those employed said they had sought a full-time job. In fact, of those who had worked all 12 months in the year previous to the interview, 11% had also looked for full-time work. The group most likely to have sought full-time employment, however, were those who had worked between one and eleven months in the previous year.

Table 5.2 Job-hunting[1] by Employment Status, Months Worked in Last Year, Sex and Age of Respondent

	Percent Looked for full-time work	N
Employment Status		
Employed full-time	18.3	455
Not employed full-time	10.2	477
Months worked in last year		
0	5.5	324
1-11	46.2	146
12	11.3	385
Sex of Respondent		
Male	13.6	405
Female	14.4	535
Age of Respondent (years)		
≤21	36.0	66
22-25	30.0	102
26-30	24.3	108
31-35	16.2	107
36-40	10.5	86
41-45	8.2	92
46-55	10.6	147
56-65	3.2	99
≥66	0.0	123
TOTAL	14.1	930

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[1] Respondents were asked: "In the past 12 months, have you actively looked for a full-time job?"

The difference by sex in job-hunting behaviour is insignificant. However, if employment status and sex of respondent are introduced simultaneously (analysis results not displayed), we do find a noticeable difference. Ten percent of both men and women in the currently not employed category had looked for work. Among the currently employed, 24% of the women and 15% of the men had looked for a full-time job in the past twelve months.

The relationship between age and job-hunting activity is negative and linear. Older respondents are less likely to have looked for work.

Several conclusions can be drawn from the analysis results presented in Table 5.2. First, younger residents of the study area are probably more likely to be attracted to new jobs created by heavy oil development, given their already higher rates of job-hunting. Second, although those who had not managed to obtain full-time work for all of the previous year were most likely to have looked for work, a sizeable proportion of residents with relatively stable employment had also done so. Third, among these respondents, women were more likely to have looked for full-time work than were men.

Residents of the study area may exhibit totally different job-hunting behaviours once construction and operation of the oil plant begins. Those who are now relatively satisfied with their work may be attracted by higher salaries and better fringe benefit packages. Such speculative hypotheses can only be tested with a second survey of the Cold Lake study area. However, present levels of job-hunting suggest that some job-switching will occur.

Currently employed women appear to be the most likely candidates although, if the Fort McMurray experience can be used for comparison, women will have a lower probability than men of being hired in jobs directly related to heavy oil extraction and processing (Gartrell et al., 1980). Employment opportunties for women will probably be greater in the service industries which will also increase in importance with population growth.

Thirty-five percent of these study area respondents disagreed with the statement "Women have a good chance for real job equality." Only 18% of the AOSERP sample of Fort McMurray residents disagreed with the same statement with reference to their community (Gartrell et al., 1980). To the extent that actual job opportunities influence perceptions of opportunity, Fort McMurray has more female employment opportunities. Heavy oil development in the Cold Lake region may produce similar opportunity structures. If it does, not all of the study area residents will approve. Only 52% of the sample approved of "a married woman working if she has a husband capable of supporting her."

5.4 Occupational and Industrial Profiles of the Study Area

5.4.1 Occupations

The construction of an oil extraction plant, housing for employees, and the variety of other facilities needed by a large industry and its employees will enlarge considerably the construction category of the study area's occupational structure. Subsequent operation of the plant will lead to an increase in the proportion of professional and technical workers in the area. An assessment of these changes is possible if the present occupational profile of the area is described.

5.4.1.1 Occupational Distribution

Four percent of the 455 currently employed respondents had managerial or administrative occupations. Three percent were employed in natural science/engineering jobs, ten percent in religious or teaching jobs, and five percent in health and medical jobs. These three categories combined into a professional-technical category account for 18% of the currently employed.

Clerical, sales and service jobs were held by 39% of the sample members. Fourteen percent considered themselves farmers and another 14% had construction jobs. The remaining 11% of the employed held jobs in a variety other occupational categories.

The single most frequently reported occupation was farming (N = 63). Although the majority of the armed forces personnel live at CFB, Cold Lake and are described in a separate report (Report III), some live off the base, primarily in Cold Lake. Consequently, the second most frequently mentioned occupation was "armed forces (other than commissioned officer)". Forty-three of the survey respondents fit this occupational category. Twenty-five "sales supervisors" were interviewed, as were 24 elementary school teachers, 21 carpenters, 12 high school teachers and 11 construction foremen.

Table 5.3 describes the occupational distribution (in eight broad categories) of the surveyed Cold Lake area labour force, for both men and women. The table also contains similar distributions, by sex of respondent, obtained from 1979 surveys of Edmonton and Fort McMurray.

Several substantial differences across surveys are apparent in this table. The Cold Lake study area clearly has a much larger proportion of residents who are farmers. Since armed forces occupations are considered service occupations, the study area also has a large proportion of clerical, sales and service jobs held by men.

Fort McMurray is distinguished by an unusually large proportion of male crafts, production, processing and construction jobs, since many of the occupations represented in the oil sands plants are clsssified as "processing". It is also noteworthy that the much smaller town of Fort McMurray has porportions of professional and technical occupations very similar to those found in Edmonton. Fort

McMurray serves as a regional administrative centre, thus accounting for some of the professional jobs, while its economy is based on a high-technology method of oil sand processing. Edmonton has a larger proportion of people employed in managerial and administrative occupations and transportation/communication jobs than do either Fort McMurray or the Cold Lake study area.

As oil-based development takes place in the Cold Lake area, and the size and characteristics of the area's population change, some noteworthy changes can be expected. While the actual number of farmers may change little, the proportion of farmers will decrease. The importance to the local economy of both professional/technical and processing occupations will probably increase since a fairly complex method of heavy oil processing will be used. The relative strength of the service sector will decrease as the proportion of armed forces personnel to all other residents decreases. However, some or all of this difference may be made up as expanded community services are provided for a younger, larger population.

5.4.1.2 Occupational Status

Blishen and McRoberts (1976) have developed an occupational index which can be used to assign status scores to the 486 occupations identified in the CANADIAN CLASSIFICATION AND DICTIONARY OF OCCUPATIONS (1971). These scores are based on three components: the average income and education of the individuals in these occupations in Canada (from the 1971 Census), and the prestige rankings of these occupations (from Pineo and Porter, 1967). The scores range from a low of about 19 (occupations like hunting or trapping) to a high of around 75 (occupations such as dentistry or law). The average status score for the 455 occupations of sample respondents was 41.9. This middle-level status score would represent, for example, roughly the status assigned to a mailman or a foreman in a pulp mill or wood product factory.

A one-way analysis of variance (results not displayed) revealed that full-time employed rural farm respondents had a considerably lower average status score (31.5) than did working respondents in the other four sub-areas (averages ranging from 40.9 to 45.4). Further analyses showed that older respondents and longer-term residents of the study area had lower average occupational status scores. The explanation is that farming is assigned a very low score (approximately 24) on this status scale. Farmers are also more likely to be older and longer-term residents of the area.

If the expected changes in occupational structure described in the previous section do materialize, the average occupational prestige score for the area will increase. This will not necessarily occur because present residents with low status occupations move upward since it is the elderly who tend to have the lower status jobs.

Instead, many higher status jobs will probably be filled by qualified in-migrants.

5.4.2 Labour Force by Industrial Sectors

Two industrial sectors account for almost one-half of the jobs held by the 455 currently employed respondents. Twenty-six percent of these study area residents are employed in the public administration and defence sector (primarily the latter) while 22% work in the community, business and personal services sector. Agriculture (14%), construction (14%) and trade (12%) together cover 40% of the sample members' jobs.

Two obvious changes in the industrial profile of the study area can be predicted. If development proceeds, the construction industry will experience substantial growth and then a decline. In Fort McMurray, the construction industry accounted for 13% of the town's labour force in 1971, 35% in 1977 and 17% in 1979 (Gartrell et al., 1980). Second, the mining, quarries and oil wells sector will become a major, if not the major industrial sector. Estimates from this 1979 survey show this industrial sector currently accounting for only 3.7% of the study area's full-time employed labour force.

5.4.3 Farming in the Study Area

Although farming is a major industry in the Cold Lake study area, the area itself accounts for less than one percent of the agricultural sales in the province (Resource Management Consultants, 1978:40). While the province as a whole might not feel the effects of a change in agricultural output within the area, oil-based development could substantially alter the industrial profile of the area through its effects on agriculture. Increased prices for farm land and attractive non-farming job opportunities are only two of the possible effects. It is important, therefore, to undertake a pre-development baseline study of farming in the Cold Lake region.

When asked if anyone in the household had "produced farm crops or raised farm livestock" during the past year, 217 of the 940 respondents (23.1%) said "yes". Only 191 of the 217 lived in the rural portion of the study area. One hundred and twenty of those who reported farming activity by household members considered their occupation or that of their spouse to be farming (115 of these respondents lived in the rural area). This suggests that there are a substantial number of households in this region (including many in the rural area) where farming is a secondary occupation or interest. Only a second survey of the area can tell us whether this group increases in size as other employment opportunities appear.

Recognizing that not all of the "farming" respondents classify themselves as "farmers", the discussion below is based on data from all those who reported farming activity in their household (N = 217). Thus, this sub-sample is comprised mainly of rural residents, but also includes 26 respondents living in urban centres within the study area.

Over one-half of these respondents (54%) described their farming operation as "mixed farming" (Table 5.4). Twenty-seven percent owned a quarter section of land or less and 25% owned more than one section of land. The average number of acres owned was 535 (N = 215). The top 5% of land owners owned 20.3% of all the land reported owned by these 215 study area residents.

Only 146 (67%) of the 217 responded when questioned about their 1978 gross income from farming. They reported an average gross income of $23980. Gross incomes of less than $2000 were reported by 27% of this sample and $2000 to $10000 by 28%. While over one-half of this farming sample had fairly low agricultural incomes, only 11% reported 1978 gross farming incomes of more than $50000. The relatively low survey estimates appear to support the claim that average farm incomes in the area are lower than the provincial average (Resource Management Consultants, 1978:40).

Fifteen of the 217 farming respondents answered "a lot" or something similar to the question: "If you sold this farm today, how much would you ask for it?" Fifty-three did not answer the question but the remaining 164 gave an average answer of $211,000. Market value estimates of one quarter million dollars or more were provided by 58 (27%) of the 217. It is apparent that, although average farm incomes are not substantial, perceptions of the increasing value of farm land are found frequently.

5.5 Incomes

Having looked at farming incomes, it is appropriate to begin a more detailed examination of incomes throughout the study area. The major emphasis will be on total 1978 household income, although the discussion below focuses first on respondents' 1978 personal income. Farmers and those drawing some income from farming are included in the discussion, although efforts are made to identify any biases their inclusion in the analysis might produce.

The importance of a baseline study of income levels and distributions in the area cannot be over-emphasized. The development of a major natural resource will attract many people to the area. Income levels are very likely to rise, but not necessarily for all residents of the area. Better informed planning and policy-making in response to development may be possible if post-development income levels and distributions in the study area can be compared to their pre-development counterparts.

5.5.1 Individual Incomes

Eighty-nine percent of the sample (N = 833) answered the question about their own (net) incomes in 1978. Their average response was $7857. Of those who answered this question, 24% reported incomes of less than $1000, 41% had

1978 incomes of $1000 to $9999, and 15% reported incomes of $10000 to $14999. Incomes in 1978 equal to or larger than $15000 were received by 20% of this sample of Cold Lake study area residents.

5.5.1.1 Sex and Employment Status Differences

Men reported much higher 1978 incomes (average = $12399) than did women (average = $4579), primarily because men were much more likely to be employed than were women (Table 5.1). Since some women were active in the labour force and some men were not, differences by employment status are even larger. Those currently employed when interviewed had average 1978 incomes of $12846 (N = 382) compared to an average of $3633 for those not active in the labour force (N = 451).

5.5.1.2 Age and Length of Residence in the Study Area

Respondents under 25 years of age (N = 151) had an average 1978 income of $6445. Average incomes increase to $8253 for those aged 26 to 35 (N = 196), and $10235 for respondents older than 35 but younger than 46 (N = 157). The average income for the 215 respondents aged 46 to 65 is lower ($8359) but not nearly as low as that reported by the 113 post-retirement age respondents ($4763).

Length of residence in the study area and 1978 individual income have a somewhat similar curvilinear relationship. The shortest-term residents (less than one year) do not have as low average incomes ($7947) as do the youngest residents. Some short-term residents are probably more qualified better-paid in-migrants and their incomes raise the average for this migration cohort. Like the age-income relationship, however, the longest term residents of this area have the lowest average incomes. Those who had lived in the area between 20 and 50 years had an average 1978 income of $6030, but the lowest average of all cohorts was for the 50 year and over cohort (N = 87).They had an average income in 1978 of $5200.

Other studies of industrial development in rural areas have documented the unequal benefits of development (Summers et al., 1976). The elderly long-term residents of communities are frequently least likely to benefit. In this case, the elderly who comprise a significant proportion of the study area population (and communities like Bonnyville in particular), already have low incomes. While costs of living are likely to rise along with incomes for those who can take advantage of new employment opportunities, the incomes of the elderly will probably not keep pace.

5.5.1.3 Education and Income

The average number of completed years of education for this sample was not particularly high (average = 10.5 years) since elderly respondents (with relatively low educations) form a substantial portion of the sample. Thirteen percent of the respondents had six or fewer years of formal education, 25% reported seven to nine years, and 20% had completed 10 or 11 years of education. Combining these three categories, we find that a full 58% of the sample had not completed high school (or an equivalent 12 years of formal education). Nineteen percent did report 12 but no more years of education and 18% had 13 to 16 years of formal education. More than 16 years of education had been obtained by only 5% of these 940 sample members.

The relationship between education and 1978 individual income for this sample makes a classic argument for obtaining a higher education. Averages of $5383 (0 to 6 years), $6151 (7 to 9 years) and $7958 (10 or 11 years) were reported by those who did not complete high school. The average for those with 12 years of formal education ($6829) drops slightly. The explanation is, simply, that women have generally been less likely to drop out of high school and less likely to enter and stay in the labour force after leaving school. Thus, the 12 years of education cohort has a larger than normal proportion of women (70%).

Post-secondary education appears to provide a significant pay-off in this area. An average 1978 income of $10887 was reported by the 156 respondents with 13 to 16 years of education. The most educated cohort had an average income of $14469.

A substantial part of this education-income relationship is a function of the age distribution of the population. Older residents of the area are much less likely to have higher educations and also much less likely to be either employed or employed in a high-salary job. The correlation between age and years of education is -.524 (N = 936). As the population composition of the area changes, the large education differences may be somewhat reduced.

The Fort McMurray experience suggests that changes in the Cold Lake region occupational structure may lead to changes in the education-income relationship. In Fort McMurray, oil processing plant employees, construction workers and tradesmen have high incomes, not much different from those received by various better-educated professional and technical occupational groups. The result is that the monetary rewards of higher education seem rather low (Gartrell et al., 1980). It will be interesting to observe whether a similar phenomenon occurs for the labour force in the Cold Lake region.

5.5.2 Total 1978 Household Income

Only 716 sample members (76% of the total 940) answered a question about total 1978 household income. The average for this reduced sample was $17093. The 1977 average total income for Alberta households was $17550 while the equivalent national average was $16764 (Statistics Canada, 1979). If these two comparison figures are increased by a 10% inflation factor (to account for the 1977-1978 difference) we obtain approximate averages for Alberta of $19305 and for Canada of $18440. The Cold Lake study area appears to have somewhat lower than average household incomes.

Eleven percent of the sample had 1978 total household incomes of less than $5000. Total incomes of $5000 to $9999 were reported by 18% of the respondents while the categories of $10000 to $14999, $15000 to $19999, and $20000 to $24999 each accounted for 16% of the sample. Twenty-three percent of the 716 sample members who answered this question said their 1978 total household income was over $25000.

Survey results from the 1979 AOSERP study of Fort McMurray showed an average 1978 total household income for that community of $24695 (Gartrell et al., 1980). When that sample was restricted to only those who had lived in Fort McMurray for all of 1978, the average household income was considerably higher. The Cold Lake region, as already mentioned, contains a larger number of elderly residents whose incomes may not rise as oil-based development proceeds. An increase in average household income, perhaps not to the Fort McMurray level, can be expected nevertheless.

A number of differences in household income within the study area are detailed below. One important comparison is absent, however, since a separate discussion (Report IV) is provided for this special population. The average 1978 total household income for the families living in the two Metis settlements within the study area is $5970. These Metis families have a yearly income approximately one-third the size of the average income in the remainder of the study area (average = $17093).

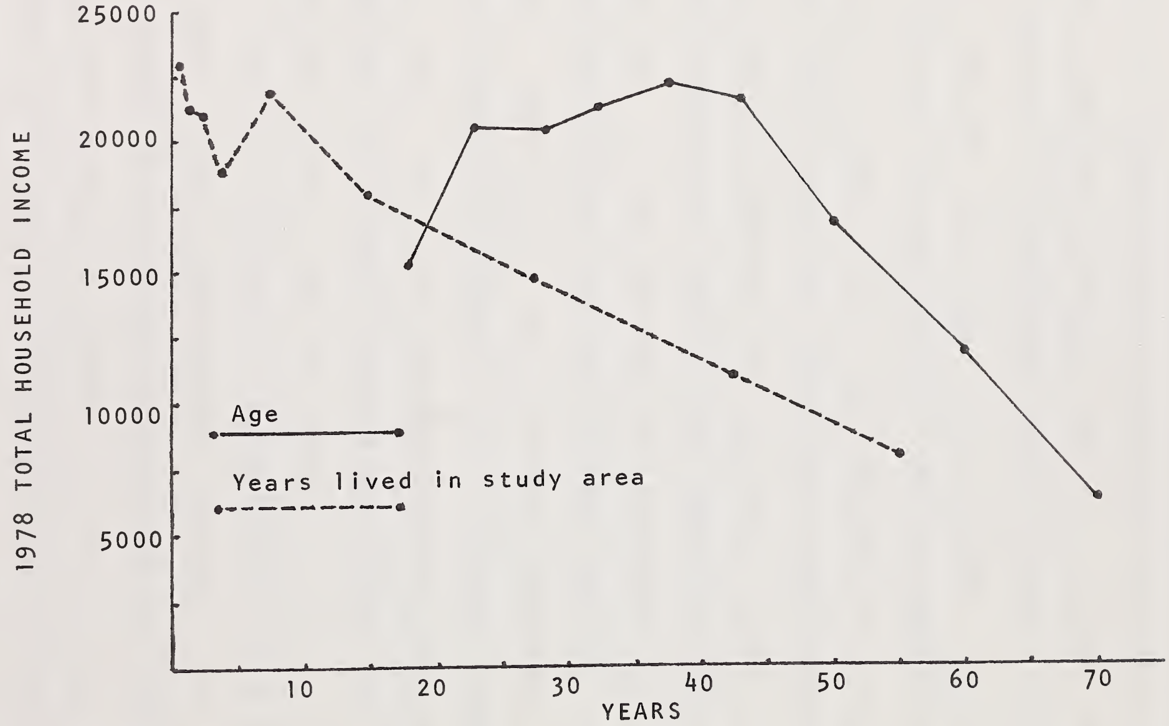
5.5.2.1 Age and Length of Residence

Average 1978 total household income is plotted for nine age cohorts and nine length of residence in the study area cohorts in Figure 5.2. Considering first the relationship between income and age, we can see a curvilinear relationship similar to that between individual income and age. The youngest age cohort report an average household income of just over $15000. The five cohorts covering ages 22 to 45 have average 1978 household incomes ranging between $20000 and $22000. The averages drop sharply after age 45 to a low of $6500 for the over 65 years of age cohort.

The five shortest-term resident cohorts (up to 10 years in the study area) had an average 1978 total household income ranging between $18800 and $23100 (Figure 5.2). The remaining four groups (more than ten years in the study area) had average incomes that drop off systematically to a low of $7700 for those who had lived in the Cold Lake region for more than 50 years.

At risk of belabouring a point made several times earlier in this chapter, construction and operation of a large heavy oil extraction and processing plant will likely alter the picture displayed in Figure 5.2. Assuming that new jobs go to younger residents of the study area (who will also be shorter-term residents of the area) and assuming

Figure 5.2 Total 1978 Household Income by Age[1] and Years Lived in Study Area[2]



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[1] Sub-sample sizes are: ≤21 years (52); 22-25 (75); 26-30 (86); 31-35 (88); 36-40 (62); 41-45 (69); 46-55 (103); 56-65 (74); ≥66 (105).

[2] Sub-sample sizes: ≤1 year (72); 1.1-2.0 (37); 2.1-3.0 (42); 3.1-5.0 (77); 5.1-10.0 (105); 10.1-20.0 (96); 20.1-35.0 (122); 35.1-50.0 (87); ≥50.1 (76).

that the incomes of these new jobs are higher than the area average, the left sides of the two plotted distributions in Figure 5.2 will become even higher than they are now.

5.5.2.2 Other Differences

Cold Lake and Grand Centre residents reported considerably higher total household incomes than did sample members living in the other three locales within the study area (Table 5.5). The explanation, again, is the differing age compositions of these five sub-areas.

Households in which the respondent was living with another adult (married or common-law) had higher average incomes ($18739) than did single adult households ($12812). Households with resident children also had higher incomes than households without children, as would be expected given the above difference by marital status. Part of this difference is accounted for by the fact that households with both spouses employed full-time had average 1978 incomes of $25183 compared to $14913 for households with only one adult or only one adult employed full-time. Furthermore, the single adult household category contains a larger proportion of elderly respondents (who are less likely to be in the labour force) than does the "spouse present" category.

Finally, respondents who said they grew up in Alberta had a statistically significant ($p < .01$) lower 1978 total household income ($15898) than did those who reported growing up elsewhere ($18704). Since longer-term residents

Table 5.5 Total 1978 Household Income by Locale, Family Characteristics and Province of Origin

	Average 1978 Total Household Income ($)	N
Locale		
Cold Lake	19400	125
Grand Centre	20348	175
Bonnyville	15612	218
Rural farm	14762	118
Rural non-farm	13791	79
Marital Status		
No spouse	12812	165
Spouse present	18379	550
Children in household		
Yes	19405	375
No	14543	340
Spouse employment		
No spouse or spouse not employed full-time	14913	564
Both employed full-time	25183	152
Province of origin		
Grew up in Alberta	15898	404
Grew up elsewhere	18704	308
TOTAL	17364	718

of the study area (with lower average incomes) are more likely to have grown up in Alberta, this is not an unusual finding. However, as development of the area proceeds and labour force demands are met with labour supplies from outside the area (and outside the province), it will be interesting to monitor this statistical relationship.

5.6 Fringe Benefits

Since not all of the rewards of employment are monetary, it is necessary to examine the distribution of fringe benefits as well as incomes in a baseline study such as this. It is obviously unreasonable to expect (non-employed) respondents to know what benefits her or his spouse receives. Consequently, this discussion is based only on information obtained from the 455 currently employed sample members.

All full-time employed sample members were asked to state which of a list of 14 possible fringe benefits they received from their employer. The percentage of the sampled labour force receiving each benefit is presented in the first column of Table 5.6. Self-employed respondents (including farmers) are included in this distribution since it is meant to represent the total full-time employed labour force of the area. The percentages (in the first column of the table) are therefore inflated somewhat since none of the 63 respondents who listed their occupation as farming reported receiving fringe benefits of any kind.

A pension plan was the most frequently received fringe benefit (44%), followed by training programs, life insurance, transportation of some kind, free or discounted merchandise and supplementary medical benefits which over 30% of the employed respondents received. Meals, a dental plan, moving expenses, and recreational facilities were benefits received by between 20% and 30% of the sampled labour force.

Stock options or profit sharing was an infrequent benefit (11%) as was a cost of living allowance (7%). Housing and utilities subsidies were almost non-existent. If, in the future, the oil companies provide benefit packages similar to those given in Fort McMurray, housing subsidies will become much more common. Almost one-half of the survey respondents in the 1979 AOSERP study of Fort McMurray reported housing subsidies of one kind or another (Gartrell et al., 1980).

The second, third and fourth columns in Table 5.6 list the percentage of Department of National Defence employees, of government and school employees, and employees of other establishments in the region who report receiving each of the 14 fringe benefits. Farmers are the only occupational group omitted.

The 87 respondents who listed DND as their employer are not all military personnel. Over one-half (N = 49) were local residents employed in other service-related jobs. Considered as a group, however, DND employees are much more likely to receive all but one of the ten most frequently received benefits. Government (all levels) and school employees are most likely to report receiving supplementary medical benefits from their employer.

Government and school employees are more likely or equally likely than other non-DND employees to receive most of the ten most common benefits. The major exceptions are transportation and free/discounted merchandise.

Considering the total full-time employed labour force in the study area, DND employees receive the most fringe benefits followed by government and school employees. Other members of the labour force receive relatively fewer fringe benefits while farmers receive none. Post-impact assessment of the distribution of benefits from employers may reveal an altered picture. In Fort McMurray, which is perhaps the most relevant comparison community, oil company employees have the most inclusive fringe benefit package, followed by public sector employees (Gartrell et al., 1980).

5.7 Standard of Living

Resource towns have the reputation of being places where relatively high incomes lead to "conspicuous consumption" and a tendency among residents to over-spend. The chance to bring home a substantial income leads to changes in spending patterns and the possibility of risking getting into debt. In fact, some writers have argued that residents of towns like Fort McMurray become trapped in the community since, to maintain their standards of living, they cannot leave their high-paying jobs (Van Dyke and Loberg,1978).

Analysis of information from the 1979 AOSERP survey of Fort McMurray shows that length of residence in that town has a small but significant effect on level of debt, controlling on income, age, education and other variables (Gartrell et al., 1980). Other than this, there is little solid evidence for the negative assessment of resource towns (Larson,1979:62). The hypothesis that, controlling on age, education, and income differences between populations of resource towns and other urban centres, there are few differences in consumption and debt patterns, remains to be tested.

Estimates of current living standards and levels of debt in the study area will allow future assessment of some of the social and economic effects of heavy oil development. It will also provide an opportunity for proper testing of some of the hypotheses about making and spending money in resource towns.

5.7.0.1 Total Sample Results

Standard of living indices frequently contain several "housing" items but, since housing is discussed in detail in the following chapter, it is not introduced in this examination of consumption patterns among residents of the Cold Lake region. Figure 5.3 displays the percentage of the total sample who reported various household possessions in their home and the percentage who reported having various investments.

Automatic washers, dryers, freezers and colour T.V.'s are found in a large majority of the sampled households. Approximately one-third of the respondents owned a dishwasher. Microwave ovens and gas barbeques, which might still be considered "luxury" items are owned by only a small minority of the sample.

A reasonable amount of investment activity is exhibited by these study area residents. Ten percent reported owning a second home or cottage and over one-quarter said they owned other property. Approximately 20% of the sample answered "yes" when asked if they owned shares/stocks, bonds, or an RRSP. Fewer RHOSP's were owned by members of this sample (4.4%). Only 42% reported having insurance on themselves, a percentage which, at first glance, appears rather low.

Comparison to survey results from Fort McMurray (Gartrell et al., 1980) reveals a surprising absence of community differences. With few exceptions, only three or four percentage points separate the results from the two surveys. Only 52% of the Fort McMurray respondents owned a freezer and 50% reported having guns in their household. Rural households are more likely than apartment dwellers in Fort McMurray, for example, to be able to make use of a freezer and to have rifles or shotguns in their home. In fact, 90% of the rural farm residents of the study area reported owning guns. In terms of investments and securities, 65% of the Fort McMurray sample reported having life insurance compared to 42% in the Cold Lake region.

5.7.0.2 Differences within the Study Area

The nine household possessions listed in Figure 5.3 were combined into a single scale by adding the number of possessions a respondent reported owning. Thus, the scale values could range from zero through to nine. A similar investments scale with possible values of zero to seven was constructed from the seven investment items listed in the same Figure. Differences by locale within the study area, age, marital status, respondents' education and total 1978 household income, for both of these scales, are presented in Table 5.7.

Rural farm respondents have the highest average score on the household possessions scale probably because of the high proportion of households in this group in which respondents reported owning both freezers and guns. Cold Lake and Grand Centre residents (who are younger, better-educated and have higher incomes) are considerably more likely to have high scores on the investment scale. Rural non-farm residents score the lowest on both of these scales.

Household possessions increase with age (up to 55) but then drop back down. Some of those over age 65 have probably moved into smaller dwellings and disposed of some of their possessions. A similar curvilinear pattern by age is found for investments. Respondents between the ages of 30 and 55 are most likely to score highly on the investment scale. As would be expected, single respondents report fewer household possessions than those living with their spouse.

Household possessions increase systematically with education in this sample obviously because a similar very strong relationship exists between 1978 household income and scores on the household possessions scale. However, sample members in the most educated category (over 16 years of education) report relatively few household possessions. This group average may be deflated by the inclusion in this group of some young but highly educated respondents who have only recently entered the labour force and who have not had time to accumulate many possessions.

The relationship between both education and total 1978 household income and investments is very clear. Better-educated, more affluent respondents are more likely to have invested some of their money in property and securities.

5.7.1 Debt

5.7.1.1 Total Sample Results

All respondents were asked "Approximately, how much do you owe to loan companies, banks, credit card companies, and so on, beyond your house mortgage?" Of the 940 sample members, 866 answered the question. This included 424 (49%)

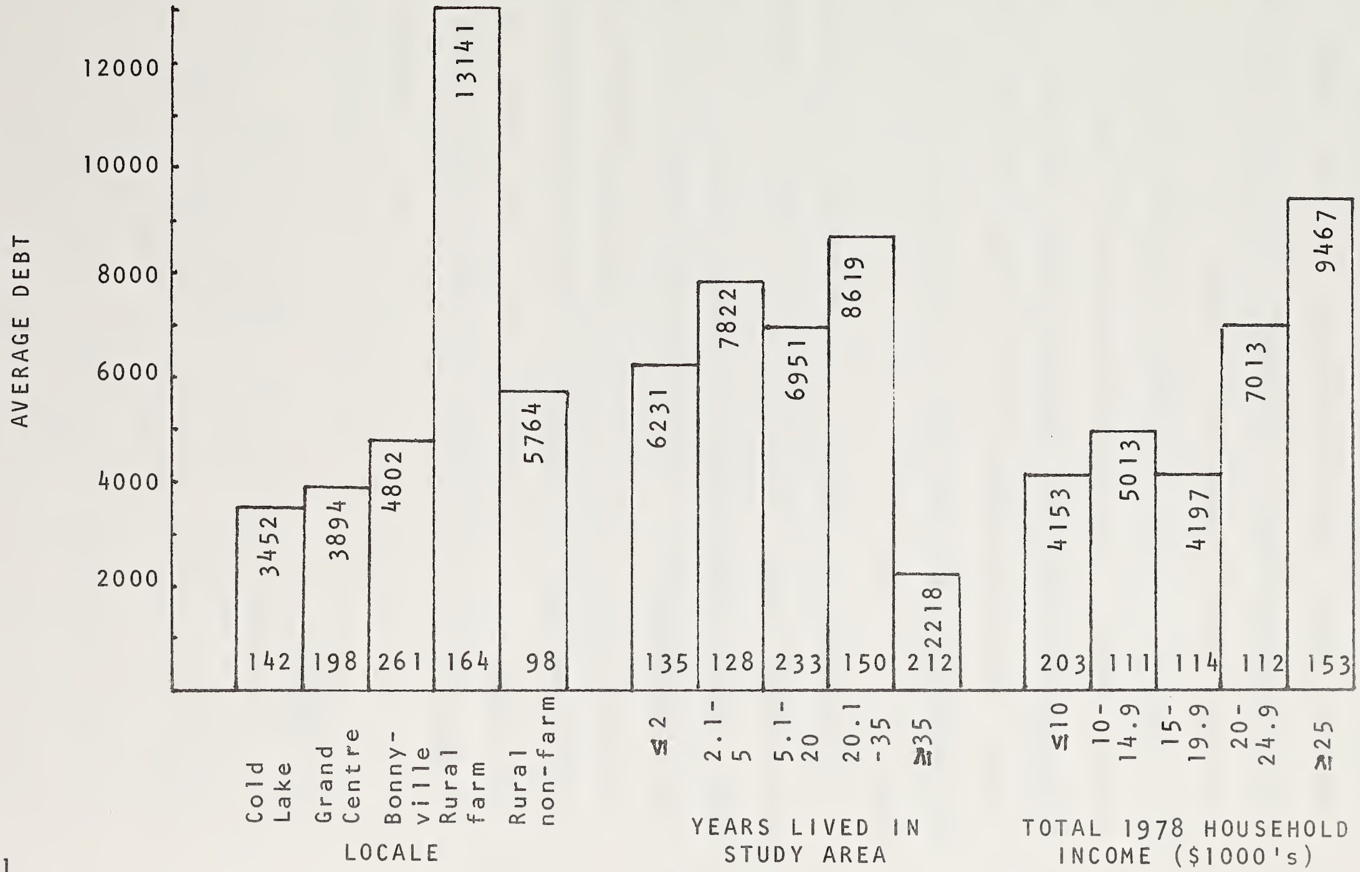
who reported no debts and four who said they had debts of $250,000 or more. The average reported debt (N = 866) was $8093. Excluding the four outlying cases in the distribution, the average reported debt was $6067 (N = 862). Since these four cases influence the total average considerably, they are omitted from subsequent analyses of debt patterns in the Cold Lake region.

The average debt reported by the 347 AOSERP sample members in Fort McMurray who answered a similar question was $3925 (Gartrell et al., 1980). Cold Lake region residents appear to be reporting debts about 50% higher, on the average, than are residents of the town of Fort McMurray. This difference is not in the direction predicted by the hypothesis relating resource towns and debt patterns of their residents. However, the large proportion of farmers in the Cold Lake region may be responsible for much of this difference. Farmers are likely to incur large debts for land and machinery along with large seasonal debts for general farm operation. Differences by locale which can be used to assess this explanation are examined below.

5.7.1.2 Differences within the Study Area

Rural farm respondents (N = 164) report a much higher average debt ($13141) than do any of the other residents of the study area (Figure 5.4). The average for the 698 sample members living in other locations is $4405. This non-farm average is much closer to the Fort McMurray average reported

Figure 5.4 Average Debt[1] by Locale, Length of Residence in Study Area and Total 1978 Household Income



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[1] In each bar, the vertically written number is the average debt while the horizontally written value is the sub-sample size.

above. Arguing that debt levels are not much different between the two samples does not alter the important fact, however, that incomes are considerably higher in Fort McMurray. Presumably, residents of that town should have less difficulty disposing of debts.

There is a small tendency for debt to increase with years lived in the study area, up to 35 years. Longest-term residents of the area (including many retired respondents) report very low debts. There is little solid evidence here that remaining in the area is associated with increasing debts.

Those with higher 1978 household incomes also tend to have higher debts. Respondents who report household incomes up to $20,000 have debts averaging between $4100 and $5000. The average debt for those in the twenty to twenty-five thousand dollar income category was approximately $7000. The highest income group reported average debts around $9500. At this point, in the Cold Lake study area, higher debts appear to be carried by those who can better afford to carry them.

5.8 Summary

The construction and operation of a heavy oil extraction plant in the Cold Lake region would have substantial social and economic impacts on the area. Some of the most important and obvious effects would be in the areas of occupations and incomes. It is important, therefore, to attempt a pre-development description of occupations and incomes in the area in order to be able to identify changes when they occur.

Labour force participation rates have increased over time in all parts of the study area. A substantial part of this increase has been a product of women entering the labour force. Survey estimates suggest, however, that the present labour force participation rate in the area is lower than the provincial average. Forty-eight percent of the sample were employed full-time at the time of the interview.

Men are more likely to be employed full-time, as are younger respondents. This difference by age leads to a substantial difference by location in the study area. Grand Centre and Cold Lake have the highest full-time employment rate. For the total region, in about 26% of the households where the respondent was married or living common-law, both spouses were employed full-time.

Residents of the study area exhibited fairly high levels of employment stability in terms of having experienced few periods of unemployment and having held only a moderate number of full-time jobs during their working careers. The currently employed had held their present job for an average of over six years. Only fourteen percent of the employed had looked for full-time work in the previous year. Women and younger respondents were more likely to have been job-hunting.

Of the currently employed, 18% had professional or technical jobs, and 39% had clerical, sales or service jobs.

Farming and construction accounted for about 14% each of the jobs represented in this sample. The average occupational status of the jobs held by sample members was not very high.

Although 217 respondents reported that someone in their household had been farming in the previous year, in only 120 of these households did someone consider their full-time work to be farming. The remainder were employed elsewhere or not employed full-time. Average reported gross 1978 income from farming did not appear very high, unlike the somewhat high estimates of current market values of their farms provided by respondents. This parallels the relatively high estimates of property value placed on their dwellings by home owners.

Sample members reported an average 1978 individual income of $7857 and an average total household income for that year of $17093. This is clearly much higher than the 1978 total household incomes of the families living on the Metis settlements in the study area (average = $5970). The income levels in the Cold Lake region appear to be lower than both Albertan and Canadian averages, and are clearly much lower than contemporary average incomes reported in Fort McMurray. Men and younger respondents had considerably higher incomes than did women and older residents of the study area. A very clear relationship exists between education and income: respondents with higher educations report higher incomes. Partly because of age differences between locales within the study area, Grand Centre and Cold

Lake residents reported considerably higher incomes.

A pension plan was the most frequently received fringe benefit among the currently employed in this sample (about 44%), while housing and utilities subsidies were almost non-existant. Employees of the Department of National Defence received the most benefits, followed by government (all levels) and school employees.

A moderate standard of living is exhibited by the residents of this area, with better-educated, higher-income residents having a better standard of living. Respondents (including farmers) reported an average non-mortgage debt of about $6000. The average for the sample with rural farm residents excluded is about $4400. Higher income households are carrying higher debts with the exception of rural farm households which, despite relatively low incomes, have much higher than average debts.

Some of what has been presented in this chapter can, at this time, serve only as baseline information. Analysis results, in combination with information from studies of communities like Fort McMurray, allow tentative speculations about changes that might occur if the Esso Resources project proceeds as planned. With construction and operation of an oil extraction plant, labour force participation rates will increase for both sexes. Women will probably be more likely to obtain employment in the expanding service industry and their labour force participation rates will increase more dramatically than will those for males. A large part of the labour force participation rate increase will be produced by jobs being obtained by young in-migrants. However, current residents of the area would probably also be able to enter the enlarged labour market and an increase in job-switching may be experienced. Some of those currently involved in part-time farming, for example, might be attracted to other employment.

Given an increase in high technology and managerial jobs associated with project construction and operation, and a general increase in the local demand for labour, effects on incomes in the region can be expected. Income levels would likely increase and fringe benefits could improve. Housing subsidies, to discourage turnover, may be increasingly used as part of fringe benefit packages. The increase in incomes should also lead to an increase in standard of living for those who can take advantage of new employment opportunities. The effects on debt patterns are difficult to predict. It is quite likely, however, that the large number of elderly residents in the area who currently have relatively low incomes would be less likely to benefit from these changes than would younger current residents and younger in-migrants to the area.

6. HOUSING

6.1 Introduction

Housing quality is an important component of the quality of life in all communities (Campbell et al., 1976) but may be of critical importance in resource development communities (Lucas,1971; Bowles,1980). In such towns, sudden population growth can lead to severe housing shortages and inflated housing costs. These conditions, together with the sometimes provision of second-rate housing in response to shortages, can generage substantial levels of housing dissatisfaction. The experience of Fort McMurray residents over the past decade is a good example of such a process (Matthiasson,1970,1971; Larson,1979; Gartrell et al., 1980). Because residential stability and housing satisfaction are asssociated (Speare,1974), the issue of housing is important for both community stability and industrial efficiency. It has been argued, for example, that better housing may result in lower turnover and, consequently, more efficient operation of the proposed heavy oil plant in the study area (Resource Management Consultants,1978:171).

The availability, cost and quality of housing are, then, important issues to consider in a baseline survey such as this. At the time of interviewing, a true baseline assessment of housing in the area was no longer possible since some land speculation and housing constructin had already occurred in anticipation of an imminent population increase. However, since the major housing demand will not occur until plant construction begins, important comparisons between the survey results presented in this chapter will be made possible by a future second survey of the residents of the study area.

Three major housing-related topics are discussed below:

1. Housing Supply (past and present housing stocks, residential mobility, and residents' attitudes toward housing stocks);
2. Housing Costs (for both owners and renters): and
3. Housing Quality (individual evaluations of various aspects of their residences).

As in other chapters, locale within the study area is used to analyze all three of these topics. House type is a second major independent variable in this chapter. Respondents' age, income, and length of residence in the study area are some of the other explanatory constructs employed.

6.2 Housing Supply

6.2.1 Changes Over Time

Housing stocks in each of the three major communities and the rural portion of the study area, for 1961 through to 1976, are presented in Table 6.1. Rural farm and rural non-farm residents cannot be differentiated in this Canadian census data as they are in the survey results presented in this report.

Table 6.1 Housing by Type and Percentage Change, Cold Lake Study Area and Component Parts: 1961 - 1976.

Area and Housing Type	1961		1966		1971		1976		1961-1976 Percent Change
	#	%	#	%	#	%	#	%	
Total Study Area[1]	2,760	100.0	2,821	100.0	3,075	100.0	3,615	100.0	+ 31.0
Single-Detached	2,345	85.0	2,451	87.0	2,580	83.9	2,835	78.4	+ 10.0
Single-Attached	252	9.1	179	6.3	120	3.9	230	6.4	- 8.7
Apartment	118	4.3	114	4.0	215	7.0	185	5.1	+ 56.8
Mobile	45	1.6	77	2.7	160	5.2	365	10.0	+ 711.1
Bonnyville	478	100.0	561	100.0	695	100.0	885	100.0	+ 85.1
Single-Detached	331	69.2	422	75.3	540	77.7	670	75.7	+ 102.4
Single-Attached	76	15.9	67	11.9	40	5.8	105	11.9	+ 38.2
Apartment	61	12.8	65	1.6	105	15.1	80	9.0	+ 31.1
Mobile	10	2.1	7	1.2	10	1.4	30	3.4	+ 200.0
Cold Lake	292	100.0	303	100.0	345	100.0	395	100.0	+ 35.3
Single-Detached	251	86.0	253	83.5	285	82.7	325	82.3	+ 29.5
Single-Attached	21	7.2	23	7.6	25	7.2	20	5.1	- 4.8
Apartment	10	3.4	20	6.6	25	7.2	25	6.3	+ 150.0
Mobile	10	3.4	7	2.3	10	2.9	25	6.3	+ 150.0
Grand Centre	355	100.0	457	100.0	585	100.0	830	100.0	+ 133.8
Single-Detached	298	84.0	329	72.0	360	61.5	540	65.1	+ 81.2
Single-Attached	22	6.2	60	13.1	25	4.3	75	9.0	+ 240.9
Apartment	20	5.6	17	3.7	75	12.8	40	4.8	+ 100.0
Mobile	15	4.2	51	11.2	125	21.4	175	21.1	+1,066.7
Rural MD 87	1,635	100.0	1,500	100.0	1,450	100.0	1,505	100.0	- 8.0
Single-Detached	1,465	89.6	1,447	96.5	1,395	96.2	1,300	86.3	- 11.3
Single-Attached	133	8.1	29	1.9	30	2.1	30	2.0	- 77.4
Apartment	27	1.7	12	0.8	10	0.7	40	2.7	+ 48.1
Mobile	10	0.6	12	0.8	15	1.0	135	9.0	+1,250.0

[1] Excludes Cold Lake Canadian Forces Base and Indian Reserves.

Source: Statistics generated from data made available in Census of Canada enumeration area tabulations.

Total housing stocks increased over this fifteen year period in all three of the communities and decreased slightly in the rural portion of the study area (from 1635 to 1505). The decrease represents the general depopulation trend experienced by the rural areas of Canada (Kalbach and McVey,1979:119) in general, and the rural portion of the study area in particular.

The housing stock increase of about 35% in Cold Lake (from 292 to 395 housing units) is considerably smaller than the 15-year increases in Bonnyville (85%) and in Grand Centre (134%). Comparing housing stock increases from 1971 to 1976 across the three communities, we find that the largest increase was experienced by Grand Centre (42%) and the smallest by Cold Lake (15%). Housing stock increases clearly vary widely across the study area.

Further inspection of Table 6.1 reveals that the largest proportion of the increases in each of these three communities has been in single detached dwellings. One other noteworthy change is the increase in mobile homes in Grand Centre (from 15 in 1961 to 175 in 1976). A 1977 housing inventory for the area reports 217 mobile homes in Grand Centre (Resource Management Consultants,1978:171a). This change in housing type frequency is probably an indication of changes to come if heavy oil development proceeds. Sudden and large population increases often produce shifts away from single family dwellings to a predominance of multiple family dwellings and mobile homes. In Fort McMurray, for example, single dwellings composed 92% of the housing stocks in 1961. By 1979, only 29% of the dwelling units were of this type. Twenty percent were mobile homes and the remainder were some form of multiple-family dwelling (Gartrell et al., 1980).

6.2.2 Present Housing Stocks: Survey Estimates

Survey estimates of housing stocks for the study area in 1979 place single dwellings at 77% of the (weighted) total. Mobile homes comprise the next largest category (10%), followed by dwelling units in apartment buildings (6%) and duplexes or semi-detached units (3%). The remaining four percent is made up of townhouses, basement suites and various other forms of housing. Because of the clear predominance of several housing types, the discussion in the remainder of this chapter will be restricted to comparisons between single detached dwellings, multiple unit housing structures (duplexes, apartments, basement suites, etc.), and mobile homes. The distribution of these three housing types in each of the sub-areas of the study area, as estimated by this 1979 survey, is displayed in Figure 6.1.

Cold Lake and Bonnyville have roughly the same proportion of housing units in multiple-unit structures (20%), while Grand Centre has relatively fewer of such dwellings (11%). In the latter community, there is a considerably higher proportion of mobile homes (18%) compared to Bonnyville (12%) and Cold Lake (5%). The prominence of mobile homes in the housing profile of Grand Centre has been apparent for well over a decade (see Table 6.1).

Most of the farming respondents in this survey lived in single dwellings (94%), although a small proportion were living in mobile homes (6%). Eight percent of the rural non-farm sample members lived in mobile homes and six percent lived in some form of multiple-family dwelling. The remaining 87% were residents in single detached dwellings. These housing type distributions for the rural portions of the study area are quite similar to those found in the survey of the two Metis settlements in the area where 88 of the 91 families lived in single detached houses. The remaining three families were living in mobile homes (see Volume IV of this report).

6.2.3 Residential Mobility

Respondents in this survey had lived in their present residence an average of 7.1 years. Twenty-two percent had lived in that particular dwelling for less than one year, a proportion quite similar to that found in the 1979 Edmonton Area Study (20%), but much lower than the estimate of 53% obtained from the 1979 AOSERP survey of Fort McMurray (Gartrell et al., 1980). While resembling Edmonton in terms of the relative proportion of short-term residents, the Cold Lake study area appears to contain a much larger proportion of people who have lived in their present dwelling for five years or longer (57%). Comparable survey results from Edmonton are 39% while only 8% of the 1979 survey respondents from Fort McMurray had lived in their dwelling for five years or longer.

Considering the study area as a whole, then, residential mobility appears to be relatively low. This is as expected, given the long average residence in the study area (20.7 years) and the large proportion of relatively old respondents in the sample. Figure 6.2 displays the plotted average length of residence in the study area and in the respondents' present dwelling for nine age cohorts in the total sample. It is quite clear that time lived both in the study area and in the present residence increase with age. The three youngest age cohorts (up to 30 years of age) had lived in the study area averages of 7 to 9 years, but in their present residences averages of only 1 to 3 years. The oldest cohorts (over age 55) had been living in their current homes an average of about 14 years but in the study area an average of over 35 years.

It is also clear, however, that some residential mobility has been occurring in the study area, particularly among younger residents. Because age distributions vary considerably across sub-areas within the study area (see chapter 3 of this report), levels of residential mobility also vary accordingly. The major difference is between rural farm respondents and the remainder of the sample. Only 5% of the respondents living on farms had lived in their present dwellings for less than a year but 72% had been there for five years or more. Twenty-seven percent of the respondents in the other four sub-areas had been in their current residences for less than one year and 36% had been there for five years or longer.

Thus, if farming respondents are omitted, we discover a slightly higher level of residential mobility than that found in Edmonton. These averages do not, of course, resemble those from Fort McMurray where about twice as many respondents had been living in their present dwelling for less than a year. As population increases accompany heavy oil development, the distributions can be expected to become more similar.

6.2.4 Attitudes Toward Housing Supply

All respondents were asked how strongly they agreed or disagreed with the statement "It is hard to get the kind of housing you really want." The response distributions suggest a fairly wide-spread perception among study area residents that housing stocks are not completely adequate. Of all the respondents, 44% agreed with the statement, including 15% who chose the "strongly agree" response category from the seven-point response scale. Seventeen percent chose the neutral response category, 34% disagreed with the statement and 5% did not respond to the statement. A comparison with responses to a similar statement used in the 1979 AOSERP study of Fort McMurray helps to put this expression of dissatisfaction into perspective. In that community, 74% of the 430 respondents agreeed with the statement and a full 45% of the total chose the "strongly agree" response (Gartrell et al., 1980).

Responses to this attitudinal statement were transformed into a zero to one hundred scale with higher scores representing more dissatisfaction with housing supply (more agreement with the statement quoted above). The breakdowns of average scores by locale within the study area, house type, and length of residence in the study area are provided in Table 6.2.

Farming respondents express least dissatisfaction with their areas' housing supply (average = 53.4) while Cold Lake (average = 61.3) and Grand Centre respondents (average = 60.3) are most likely to agree with the negatively-phrased question. Bonnyville and rural farm residents are more moderate in their evaluations of housing supply. Residents of single detached dwellings are not as convinced that it is difficult to get good housing (average = 50.9) as are respondents living in some form of multiple-unit dwelling (65.4) or in mobile homes (58.7).

Those who have lived longer in the study area tend to be more positive in their evaluations of housing supplies. Similar results were obtained in analyses (not displayed) using age and, also, length of time in current residence. Older respondents have lived longer in the study area and in their present residence and are less likely to agree that "it is hard to get the kind of housing you really want." These differences by age and length of residence probably partially account for the difference by locale, since Cold Lake and Grand Centre respondents tend to be both younger and shorter-term residents of the study area.

A similar analysis, using 1978 total household income as the independent variable, revealed no significant difference ($p > .01$) by income category in responses to this statement about housing supply. This suggests that the problem may not be so much one of high costs making certain types of housing inaccesible for certain groups, but simply one of inadequate housing supply. Similarly, no significant differences by household size were discovered. Respondents with larger households were not significantly more likely to agree about the difficulty of finding good housing.

In brief, there is a substantial amount of dissatisfaction with housing supply in the study area, although the level is not as high as in communities like Fort McMurray. Respondents who have obtained a preferred form of housing (single detached) are less dissatisfied, as are older respondents and longer-term residents of the study area who, as noted in other parts of this volume, report higher satisfaction with various aspects of their lives.

6.3 Housing Costs

6.3.1 Introduction

Housing costs have been increasing throughout the country for several years and these increases have, no doubt, been observable in communities such as those in the study area. Alongside these increases, communities experiencing sudden growth often find shelter costs, for both those wishing to buy or rent their dwellings, increasing substantially. Land speculation, a shortage of land to develop, and large time lags between housing demand and construction responses to that demand, are among the factors responsible. Consequently, it is important to attempt to document housing costs in the Cold Lake study area prior to large scale development so that the effects of development and of general housing cost increases can be separated.

Information on housing costs can also be obtained from other sources (e.g. real estate sales records) but the advantage of survey estimates such as those provided below is that differential housing costs, by age, income bracket, length of residence and so on, can be obtained. These will allow future assessment of whether or not development has been equally beneficial, in terms of housing costs, for all community groups.

Home owners and renters are discussed below, first separately and then combined in the final assessment of shelter costs. Comparisons are made between the three towns in the study area. Farming respondents are omitted because of the difficulty involved in separating their housing costs and the value of their home from their total farm operating costs and total farm value. Information from rural non-farm residents is also not presented. The rural non-farm category contains a very heterogenous group of respondents, the two primary groups being elderly (often retired) residents of the several villages in the study area and residents of acreages around the towns. This latter group consists of younger, shorter-term residents of the study area who are often better-educated and have higher incomes than residents of the villages. Combining the two groups into one ("rural non-farm") is necessary because neither group is large enough for separate analysis. However, in some cases such as this analysis of housing costs, difficult to interpret results are produced.

6.3.2 Home Owners

Average estimates of the value of respondents' homes, and their reports of monthly mortgage payments and yearly taxes, are presented by community and house type in Table 6.3. The low number of owners of dwelling units in multiple-dwelling structures (7 in total) make all estimates for this category highly unreliable. Similarly, because only five Cold Lake respondents owned mobile homes, their average reports of total value, monthly mortgage payments and yearly taxes cannot be considered reliable estimates.

6.3.2.1 Estimated Home Values

In response to the question "If you sold this place today, how much would you ask for it?", the home owners in the three towns in the study area gave an average answer of $73000. Average estimates of value of single detached dwellings was $84000, while the average estimated value of 61 mobile homes owned by sample members was $28000.

These estimates are inflated by the responses from residents of Cold Lake who valued their single detached dwellings at $96000. Single dwellings in Grand Centre and Bonnyville were valued considerably lower ($79000 and $82000).

These average estimates of home value and actual real estate prices at the time of interviewing are probably quite different. First, there is no reason to believe that the homes which appear on the real estate market are a representative sample of all homes in the area. Second, respondents who are not trying to sell their home may overestimate or underestimate its market value, depending on their knowledge of the real estate market and their perception of the effects of development on housing prices. Nevertheless, these averages do provide crude estimates of the costs of (owned) housing in the three towns within the study area. A second similar survey several years in the future will be able to provide a useful set of comparative estimates, allowing an assessment of the effects of heavy oil development on housing costs.

6.3.2.2 Average Monthly Mortgage Payments

The 463 home owning respondents reported an average monthly mortgage payment of $197 (Table 6.3). This low average is, in large part, a product of the fact that 42% of these respondents reported having no mortgage payments. They had finished paying for their homes. A further 13% had monthly payments of less than $200, 15% reported payments of $200 to $300 a month, and 14% were paying between $300 and $400 a month on their mortgage. The remaining 16% of the home owners had monthly mortgage payments ranging upward from $400. This sample of home owners is almost evenly split between those who have finished paying for their homes and those making moderate level mortgage payments.

The proportion of "paid-up" home owners in Bonnyville (51%) also explains why the average mortgage payment in that town ($179/month) is so much lower than the average payment in Cold Lake ($219/month) or Grand Centre ($209/month). In Cold Lake, 38% of the home owners had no mortgage payments to make. The corresponding percentage for Grand Centre was 31%. Taking this explanation one step further, Bonnyville residents tend to be older and have lived in their present residence for a longer time. This means that they probably obtained their mortgage much sooner and have had more time to pay it off.

In both Cold Lake and Grand Centre, average mortgage payments for owners of mobile homes are lower than the average payments for owners of single detached dwellings. In

Bonnyvillle, the opposite is true. The 28 mobile home owners reported an average monthly payment of $240 compared to $164 for the 158 single dwelling owners. The explanation, again, is that owners of mobile homes probably purchased them more recently than did the owners of single dwellings.

Studies of resource development communities in other locations have demonstrated that elderly residents of these communities often benefit less than younger residents (Summers et al., 1976). Better jobs and higher incomes, for example, are unlikely to be obtained by older residents of the community. Higher living costs are, therefore, harder for this group to absorb. Housing costs in the Cold Lake study area will probably increase further. These increases will be relatively more difficult for elderly residents to handle unless, as appears to be the case for some of these respondents, they have finished paying for their homes.

6.3.2.3 Average Yearly Property Taxes

Taxes may also increase sharply as more community services are required for larger populations (see chapter 7 of this report). Unlike their potentially lower mortgage payments, the elderly residents of these communities can expect their taxes to increase faster than their incomes.

The average property tax paid in the previous year by these home owning sample members was $557, with Cold Lake and Grand Centre averages being somewhat higher than the Bonnyville average (Table 6.3). In both Grand Centre and

Bonnyville, owners of single detached dwellings paid considerably higher property taxes than did mobile home owners.

6.3.3 Renters

Average monthly rent reported by the 191 renting respondents living in Cold Lake, Grand Centre and Bonnyville was $262 (Table 6.4). Differences across these three communities are not very large. Average reported rent in Bonnyville was lowest at $242 while the highest average was obtained from Cold Lake respondents ($278/month).

There are not enough respondents renting mobile homes in this sample (11 in total) to provide reliable estimates of mobile home rents in the study area. The difference between average rent for single dwellings ($256/month) and housing units in multiple dwelling structures ($270/month) is not very large.

In both Grand Centre and Cold Lake, renting residents of single detached dwellings report lower average rents than do renters living in multiple family housing, while in Bonnyville, the opposite is true. Excluding a probably unreliable rent estimate for mobile homes in Bonnyville, the highest average rent reported was for multiple family dwellings in Grand Centre ($312/month).

In their study of Fort McMurray, Nichols and Associates (1979:112) reported that a three-bedroom mobile home which had rented for $600 a month in 1977, was renting for $450 to

$475 a month in 1979. In that community, rents had increased dramatically during the construction of the Syncrude plant but fell back down somewhat after the construction boom. The present survey results from Cold Lake, Grand Centre and Bonnyville show only moderately high rent levels compared to places like Edmonton or Fort McMurray. It is quite likely that rents will increase if the population of the area increases quickly. The extent of the increase and whether or not rents fall after a construction boom are both difficult to predict.

6.3.4 Shelter Cost Comparisons

In the above discussion of housing costs, home owners and renters have been analyzed separately. In this section an attempt is made to combine them into one sample, thus allowing some broader comparisons of shelter costs within the study area.

Yearly shelter costs for renters were calculated by simply multiplying their reported monthly rent by twelve. The comparable construct for home owners was operationalized by multiplying their reported monthly mortgage payments by twelve and adding their reported yearly property taxes to this calculated value. Missing data on the property tax variable reduced the sample somewhat to 544. Although this "shelter cost" variable overlooks the costs of upkeep and repairs for home owners, it still provides some comparability for respondents with different residential tenure statuses.

The average yearly shelter costs for these respondents from the three towns in the study area was $2872 ($239/month). The comparable value from the 1979 AOSERP survey of Fort McMurray was $4272 or $356 per month (Gartrell et al., 1980). Since Fort McMurray housing costs are typically about 20% higher than those in Edmonton (Nichols and Associates,1979:129), we can conclude that, at this point, average housing costs in the Cold Lake study area are considerably lower than those in Fort McMurray and somewhat lower than those in Edmonton.

While lower than comparable figures from these two other Alberta urban centres, this average shelter cost conceals some substantial differences within the study area. Some of these differences are presented in Table 6.5.

The huge differences in yearly housing costs by length of residence in the study area are the most striking results presented in this table. Analyses (not displayed) using age and length of time in the respondents' present residence produced very similar results. Respondents who have lived in the area ten years or less report an average yearly shelter cost of $3700. Those who have been residents of the area between ten and twenty years have an average of $2743 while longer-term residents report averages considerably lower. Residents of fifty years or more, some of whom would be living in subsidized senior citizens' residences, have an extremely low average shelter cost of $941. The explanation

Table 6.5 Yearly Shelter Cost[1] Estimates by Community, House Type, Tenure Status, Length of Residence in Study Area and Total 1978 Household Income

	Average Yearly Shelter Cost ($)	N
Community		
Cold Lake	3173	137
Grand Centre	3014	174
Bonnyville	2587	232
House type		
Single	2817	392
Multiple	3149	98
Mobile	2767	54
Tenure status		
Own home	2728	353
Rent home	3138	191
Length of residence in study area (years)		
≤ 2.0	3825	91
2.1 - 5.0	3899	97
5.1 - 10.0	3733	82
10.1 - 20.0	2743	77
20.1 - 35.0	1998	91
35.1 - 50.0	1503	51
≥ 50.1	941	51
Total 1978 household income ($)		
≤ 9999	1525	113
10000 - 14999	2217	70
15000 - 19999	3356	84
20000 - 24999	3392	78
≥ 25000	4279	112

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[1] Calculated as (monthly rent x 12) for renters, and (monthly mortgage x 12) + yearly taxes for owners.

for this relationship between length of residence and shelter cost was provided earlier - longer-term home owning residents are more likely to have lower mortgage payments, if they have any at all.

This explanation can also help us understand why we find a small non-significant difference ($p > .01$) in shelter costs by tenure status. Renters have an average $410 higher than owners (a difference that would probably disappear if home repairs and upkeep were considered). A substantial number of respondents who have low or non-existent mortgage payments are included in the calculation of the low yearly average shelter cost for owners ($2728).

The analysis results in Table 6.5 also demonstrate that housing costs increase fairly systematically with income. Respondents who report a high 1978 total household income are also likely to report a relatively high yearly shelter cost. Prior to full-scale development in the study area, housing costs and income appear to be reasonably correlated. Wide-spread increases in housing costs without accompanying wide-spread increases in income could lead to a situation where shelter costs consume a much larger proportion of the incomes of some groups than of others.

6.4 Housing Quality

6.4.1 Objective Measures

Respondents reported an average of 6.0 finished rooms in their dwellings including an average of 2.9 bedrooms and

1.3 bathrooms. Division of the number of people resident in the household by the number of finished rooms resulted in an average of 0.56 persons per room. Further breakdowns of these objective housing characteristics by sub-area of the study area are found in Table 6.6.

The smallest homes (measured by number of finished rooms) are reported by Bonnyville and rural non-farm respondents. Farming respondents report the largest dwellings (averaging 6.8 rooms). The number of bedrooms varies across sub-areas from an average of 2.6 in rural non-farm households to 3.3 in farming households. The average number of bathrooms ranges from 1.0 to 1.5. The lowest number of people per room is reported by Grand Centre residents (average = 0.5) while the highest is found in rural non-farm households (0.64).

Although Table 6.6 reveals some differences between locales in objective housing characteristics, the largest difference within the study area is not shown. The 91 Metis families living in the two Metis settlements within the study area report an average of 4.9 rooms per dwelling (Report IV). Whereas respondents in only 3% of the households discussed in this main volume of the report said they had no bathroom in their dwelling, 69% of the Metis respondents said their dwelling did not contain a bathroom. There is obviously a very distinct difference between the quality of housing in these Metis settlements and in the other communities in the Cold Lake study area.

6.4.2 Subjective Evaluations

All respondents were asked to evaluate twelve different aspects of their residence, using a seven-point "Very poor - very good" scale. Home owners were given two further items (taxes; cost to maintain home) and asked to respond using the same scale. All scores were transformed into a scale ranging from zero to one hundred. Averages for each item by locale within the study area are displayed in Table 6.7, ranked by average degree of satisfaction.

6.4.2.1 Total Sample Results

Parking and exterior space received average scores over 80 out of a possible 100 (Table 6.7). Amount of privacy from neighbours was also evaluated very positively (average = 75.7) as were storage space, condition of the exterior and interior of the residence, insulation, places for children to play and the amount of interior space (averages ranging from 70.7 to 72.6). The level of noise, room design and cost to maintain the dwelling (for home owners only) received moderately positive evaluations (averages in the 60′s). Taxes (for home owners) and landscaping were both given relatively low evaluation scores (55).

6.4.2.2 Area Differences

Comparison of average housing evaluations for each of the study sub-areas reveals that urban-rural differences are substantial in some cases (Table 6.7). Total sample averages

Table 6.7 Housing Evaluations[1] by Locale

Housing Characteristic	Cold Lake	Grand Centre	Bonnyville	Rural farm	Rural non-farm	Total
	Averages (x/100)					
Parking	74.0	76.3	75.6	95.6	90.1	81.3
Exterior space	74.7	73.4	76.3	95.0	90.5	80.8
Privacy	72.2	66.8	67.4	94.2	87.2	75.7
Storage	75.4	70.9	69.2	79.1	69.0	72.6
Exterior condition	68.7	73.9	73.1	70.2	74.1	72.1
Interior condition	70.7	73.1	76.1	66.1	67.8	71.5
Insulation	69.8	70.0	74.5	71.7	67.6	71.4
Play space for children	62.3	64.2	62.8	91.5	81.2	71.0
Interior space	69.4	68.4	74.9	68.4	65.7	70.7
Noise level	68.2	62.2	64.6	76.0	71.1	67.7
Room design	61.2	63.0	70.7	57.5	61.1	63.6
Maintenance cost[2]	66.4	63.4	59.0	59.6	53.5	60.4
Taxes[3]	56.0	46.4	53.9	63.7	57.1	55.6
Landscaping	54.2	54.5	57.0	53.1	55.0	55.0

[1] Original seven point ("very poor" to "very good") scale transformed into a zero to one hundred scale.

[2] Answered only by 557 home-owners.

[3] Answered only by 524 home-owners. The remaining items had total sample sizes ranging from 927 to 939 except for play space for children (N = 901) and Insulation (919).

for parking, exterior space and privacy from neighbours are high because of the very positive evaluations given to these aspects of their housing situation by rural respondents. Similarly, place for children to play and level of noise are given considerably higher average scores by rural residents than by residents of any of the towns in the study area.

All five of these housing characteristics are, in effect, functions of housing density. Rural residents are living in the ultimate "low density residential area" and, hence, are not bothered by neighbourhood noise, parking problems, or a lack of privacy or living space. The absence of these problems is reflected in respondents' reported satisfaction with the neighbourhood in which they live. Rural respondents (farm and non-farm combined) gave their "neighbourhood" an average satisfaction score of 85 out of a possible 100 (N = 296). The urban respondents in this sample (all three towns combined) had an average score of 75 (N = 639).

There are few important differences between the average responses from the three towns for the five housing characteristics described above. In terms of satisfaction with available space and privacy, urban/rural location of residence is clearly the important explanatory variable. Urban-rural location is also an important determinant of evaluations of the interior condition of dwellings. In this case, rural respondents provide more negative evaluations, perhaps because of a higher proportion of older dwellings.

Several of the other housing characteristics listed in Table 6.7 received relatively constant average evaluations from the five areas covered by this study. Landscaping was uniformly rated poorly (average scores ranging between 53 and 57) while the exterior condition of dwellings was viewed with a reasonably amount of satisfaction by respondents throughout the study area (averages of 69 to 74). Home insulation ratings also had moderately low variation by locale within the study area.

Rural farm residents who generally have larger homes (see Table 6.6), report the most satisfaction with storage space. These respondents are also least concerned about taxes. Other differences by locale could be identified in Table 6.7, but an examination of the effects of house type on housing evaluations would probably be more useful.

6.4.2.3 Differences by House Type

The same 14 housing characteristic evaluations are provided separately for single detached homes, multiple-family dwellings, and mobile homes in Table 6.8. Maintenance costs and taxes are rated only by home owners. Because the sample contains only seven owners of housing units in multiple dwelling structures, the average evaluations of maintenance costs and taxes from these seven are probably not very reliable.

The five housing characteristics evaluated more positively by rural than by urban respondents are also those rated noticeably higher by residents of single dwellings than by respondents living in other house types. Parking, exterior space, privacy from neighbours, play space for children and noise levels all received considerably higher average satisfaction scores from single dwelling residents than from residents of multiple-family dwellings or mobile homes.

Rural residents of the study area are much more likely to live in single detached dwellings (see Figure 6.1). This explains some of the similarity between Tables 6.7 and 6.8. However, single dwellings within urban settings also can provide more space and privacy than mobile homes or apartments/duplexes in the same environment. Thus, house type and urban-rural location may have independent effects on residents' satisfaction with these aspects of their housing.

Comparing multiple-family dwellings and mobile homes on these five housing characteristics evaluations, we note only one large difference. Mobile home residents may be less satisfied with play space for children (average = 52.4) than are residents of single dwellings (average = 78.4). However, next to multiple-family dwellings (average = 35.3), mobile homes appear to be viewed tolerantly.

If large-scale development within the study area proceeds, the proportion of families with young children will probably increase. In a subsequent survey of area residents, satisfaction with this aspect of housing will be a partial function of the extent to which these young families manage to acquire single housing. Another comparison with 1979 Fort McMurray survey results is appropriate. In that community with only 29% single detached dwellings, respondents gave "places for children to play" an average score of 51 out of 100 (Gartrell et al., 1980). The comparable pre-development score from the total Cold Lake area was 71.0.

No important differences by house type are found for interior condition, insulation or room design. Average evaluations (by home owners) of taxes and maintenance costs differ little between residents of single dwellings and mobile homes. However, mobile home residents are least satisfied with storage space and general interior space as well as with landscaping. In fact, the lowest rating given in Table 6.8 is for landscaping from mobile home residents. Trailer park landscaping in the Cold Lake region appears to be little different than in other urban areas.

6.4.2.4 General Housing Evaluation

A housing evaluation scale was constructed from the responses to the twelve evaluation items appropriate for all respondents by simply adding the scored responses for these items. "Taxes" and "cost to maintain home" were omitted since only home owners answered these questions. The summed scores were then transformed into a zero to one hundred scale. Missing data on some of the twelve items reduced the sample to 864 respondents with an average score of 63.1 on this highly reliable scale (Alpha = .848). Average scale scores by locale within the study area, house type and respondents' age are given in Table 6.9.

Rural farm (average = 67.2) and rural non-farm residents (average = 65.0) have higher average scores on this housing evaluation scale than do respondents living in any of the three towns in the study area. This difference is obviously accounted for by the five "space and privacy" scale items which rural respondents evaluated considerably more positively. Respondents in single detached dwellings report greater residential satisfaction (average = 65.4) than do residents of multiple-family dwellings (average = 53.8) or of mobile homes (average = 55.7).

Finally, older residents of the study area are more likely to evaluate their houses positively. Residential evaluation scores increase systematically through the six younger age cohorts, level off for ages 46 to 65, and then drop off slightly for senior citizens. A very similar relationship was found between housing satisfaction and years lived in the study area so the results of only the age-housing satisfaction analysis are displayed.

Significant differences ($p < .01$) in housing evaluation were not found when household size or total 1978 household income were used as independent variables. Instead, the important explanatory variables appear to be location within the study area, house type and age. These three factors are

Table 6.9 Housing Evaluation Scale Scores[1] by Locale, House Type and Respondents' Age

	Average Housing Evaluation Scale Score (x/100)	N
Locale		
Cold Lake	60.3	136
Grand Centre	61.1	196
Bonnyville	62.5	248
Rural farm	67.2	184
Rural non-farm	65.0	100
House Type		
Single	65.4	681
Multiple	53.8	89
Mobile	55.7	94
Respondents' Age (years)		
≤ 21	53.7	61
22 - 25	57.0	95
26 - 30	58.3	101
31 - 35	62.8	103
36 - 40	64.7	83
41 - 45	65.4	88
46 - 55	68.5	139
56 - 65	68.1	93
≥ 65	64.2	99
TOTAL	63.1	864

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[1] Calculated by adding scores to the twelve individual housing characteristic items answered by all respondents (see tables 6.7 and 6.8).

interrelated since older respondents are both more likely to live in single dwellings and in rural areas. Furthermore, all rural respondents are more likely to live in single dwellings. A more sophisticated multi-variate analysis could isolate the independent effects on housing satisfaction of these three factors. However, it would not alter the major conclusion which can be drawn from these results: development of heavy oil will almost certainly increase both the proportion of younger residents in the area and the proportion of urban residents, and reduce the proportion of single dwelling residents. This suggests that general satisfaction with housing may be expected to decrease.

6.5 Summary

A better quality of housing in an area can lead to more satisfaction among residents and, possibly, lower population turnover. Both construction and operation of the proposed Esso development would probably be enhanced by such a situation.

Between 1961 and 1976 total housing stocks increased in the urban portions of the study area. Grand Centre experienced the highest rate of growth (134%), followed by Bonnyville(85%), and Cold Lake (35%). Coupled with a decrease in the rural area, these trends follow those for population change in other parts of the country.

In all three urban communities, the largest part of the increase in housing stocks was in single family housing.

Sample estimates placed single detached housing at about 77% of the households in the region. There was also an increase in the number of mobile homes in Grand Centre. Rapid population growth may produce a change in housing composition within the study area. The proportion of mobile homes and various forms of multiple family dwelling will probably increase. Bonnyville and Grand Centre currently have the highest proportion of multiple family dwellings (about 20% in each).

Survey estimates show an average of 7.1 years in present dwelling, a figure that is slightly higher than comparable data for Edmonton, and much higher than data from Fort McMurray. Residential mobility is relatively low, but is somewhat higher among young respondents (under 30), and among those who lived in the three towns within the study area. As migration to the area increases, residential mobility will increase as well.

Attitudes towards the housing market showed a more positive response in the Cold Lake region than in Fort McMurray. Older respondents who had lived longer in single family dwellings in rural areas were more positive. This was so particularly when such residents' attitudes towards the housing market were compared with those living in multiple family dwellings or mobile homes in Grand Centre.

The average price estimated for single family dwellings by their owners in Cold Lake was $96,000. For Bonnyville and Grand Centre the figures were somewhat lower ($82,000 and

$79,000, respectively). Property taxes averaged $557/year and average shelter costs for homeowners were low ($192/month), largely because 42% of the urban homeowners had no mortgage payments. Renters (30% of the urban sample) paid an average of $262/month, with little variation between the three towns in the study area. These rents were considerably lower than those in Edmonton, and lower yet than those found in Fort McMurray. Renters might expect to face increased costs with rapid population increases. Older respondents who had lived longer in the study area had much lower shelter costs. Shelter costs were also a direct function of incomes.

Bonnyville residents reported the smallest homes, and rural farm families reported the largest dwellings. Throughout the study area, housing appeared to be better than it was for the residents of the two Metis settlements discussed in Report IV.

Parking, exterior space, privacy, places for children to play, and level of noise were given high quality ratings, particularly by rural residents. These features appear to be largely a function of housing density and, consequently, have an important effect on neighbourhood satisfaction. On the other hand, rural residents gave lower ratings to the interior of their dwellings, perhaps because of their age. Landscaping was uniformly rated as relatively poor quality in all locales within the study area.

As expected, single detached dwellings were generally rated more highly than other dwelling types. Satisfaction with housing quality increases with age, but drops slightly for those over age 65. If the housing mix and the population composition of the area are altered by rapid development, perceived housing quality could change dramatically.

7. COMMUNITY SERVICES: USE AND EVALUATION

7.1 Introduction

A baseline study of an area which is expected to experience a great deal of industrial growth in the next few years should include an assessment of community services. The quality of such services, whether provided privately or by government, is an important correlate of individuals' satisfaction with their community (Campbell et al., 1976).

The sometimes inadequate service delivery systems found in isolated single industry communities have been frequently described (Lucas, 1971; Riffel, 1975; Himmelfarb, 1976). However, the communities in the Cold Lake development area cannot really be described as isolated. Hence, a forecast of service delivery problems as a consequence of an imminent shift to predominance of a single (petroleum-based) industry would probably be incorrect. Instead, the rapid population increase in the affected communities will probably be the factor responsible for the development of service delivery problems of varying magnitude.

If the experience of communities like Fort McMurray is any indication, most problems might be expected to occur during the actual construction of the petroleum-extraction plants. It is during this period when the presence of many construction workers further enlarges an already rapidly expanding population (Hobart et al., 1979; Nichols and Associates, 1979) and, typically, further strains service delivery systems.

Both the use and evaluation of community services are discussed in this chapter with considerably more emphasis on the latter. More detailed records of service use in the Cold Lake-Bonnyville area might be obtained from the agencies and institutions involved in actual service provision. Survey generated service use data is presented, then, not so much for purposes of estimation as for purposes of description and statistical control. Since the main emphasis in this chapter is on individual evaluations of community services, it is improtant to consider whether an individual's evaluation of a service varies with his/her use of the service.

7.2 Service Use Patterns

Estimates of service use were obtained by asking individual respondents whether they had used a specific community service in the twelve months prior to the interview. The percentage of the total sample answering "Yes" was used to rank the nine services (Table 7.1). This table also contains the reported-use percentages for the five sub-areas within the larger study area.

Services divide by relative frequency of use into two distinct types - those services used by between 20% and 60% of the total sample and those used by less than one-tenth of the sample. Ambulance, counselling, day care and fire protection are the four services in the lower-use category.

In this group, only day care service use appears to differ noticeably by locale. Eleven percent of the Grand Centre respondents who answered this question did so in the affirmative, compared to 4% or less in each of the other sub-areas.

Over one-half of the sample (56%) had used the area's hospital services in the past twelve months while 33% reported use of the public health services. Utility maintenance services also had received relatively heavy use in the previous year with 41% of the sample reporting use. The police department had received calls from 31% of the sample. Finally, 21% of the respondents said that they had used the public library. The only important difference in use by locale, for this set of five services, was for the public library where rural respondents reported significantly less use than did residents of the three towns in the study area. Differential access to library facilities is probably the major reason for this difference in use by locale.

7.3 Problems of Service Provision

As one means of collecting evaluations of community services, respondents were instructed to answer "Yes" or "No" to a series of items about service-related problems they might have encountered in the previous year. These items, again ranked by percentage of affirmative responses from the total sample, are presented in Table 7.2.

Table 7.2 Service-related Problems Encountered in the Past Year by Locale

Service-related problem	Cold Lake	Grand Centre	Bonnyville	Rural farm	Rural non-farm	Total[1]
	Percent					
Finding a particular article or product	58.5	56.4	37.9	48.0	41.3	47.8
Finding good entertainment (movies,etc.)	55.8	46.0	32.2	27.2	33.9	38.3
Finding good recreational activities	27.1	28.4	31.8	20.7	33.8	28.2
Getting a car fixed	18.5	23.8	17.6	21.0	23.6	18.5
Vandalism, theft, problems with juveniles	19.4	20.3	11.9	15.2	24.1	17.0
Finding a good household repairman	17.3	21.5	11.3	14.9	14.8	15.7
Getting medical or dental treatment	13.3	17.9	8.5	14.0	16.6	13.4
Cashing or writing a cheque	7.7	8.4	2.3	8.3	8.0	6.4
Borrowing money	6.9	6.9	7.4	0.6	4.9	5.6

[1] Total sample sizes ranged from 932 to 940 because of missing data for some of the items. Sub-sample sizes for the five sub-areas are, consequently, very similar but not always identical to those displayed in Table 6.1.

Differences between the three towns and the two rural residence categories in the study area can also be determined by comparing columns within this table.

7.3.1 Shopping Facilities

Almost one-half of the respondents(48%) answered "Yes" when asked if "getting an article or product that you wanted to buy" had been a problem in the last twelve months. This sentiment is supported by responses to the statement "When you go shopping you can find what you want." While 54% of the total sample agreed, 16% chose the neutral response category and 30% disagreed. It is difficult, in the absence of comparison data, to state whether the study area is different in this respect from other areas with similar urban-rural residential distributions. However, it is clear that a substantial number of the area's inhabitants are not completely satisfied with available shopping facilities.

Residents of Cold Lake (59%) and Grand Centre (56%) were more likely to consider the non-availability of shopping facilities as problematic than were respondents from Bonnyville (38%) or the rural parts of the study area (41% and 48%). Several factors may be responsible for this pattern. Bonnyville, being one of the larger communities in the area, has better shopping facilities. This does not, however, explain the lower "problem ratings" from rural respondents. Alternatively, the characteristics of Bonnyville and rural residents may make them more inclined to evaluate shopping facilities positively. Respondents in this group are generally older (mean = 45 years for Bonnyville and the rural areas) than respondents from Cold Lake (mean = 40 years) or Grand Centre (mean = 39 years). Bonnyville respondents have lived in the study area for a longer time (mean = 23 years) as have rural respondents (mean =28 years) than have respondents living in Cold Lake (mean = 15 years) or Grand Centre (mean = 12 years). Younger respondents may evaluate as inadequate shopping facilities considered satisfactory by older residents. Furthermore, older and longer-term residents of a community are generally more likely to evaluate various aspects of their community positively. This phenomenon partially accounts for these differential evaluations of shopping facilities and, as will be further demonstrated below, probably explains other differences by locale in community service evaluations.

7.3.2 Entertainment and Recreation Facilities

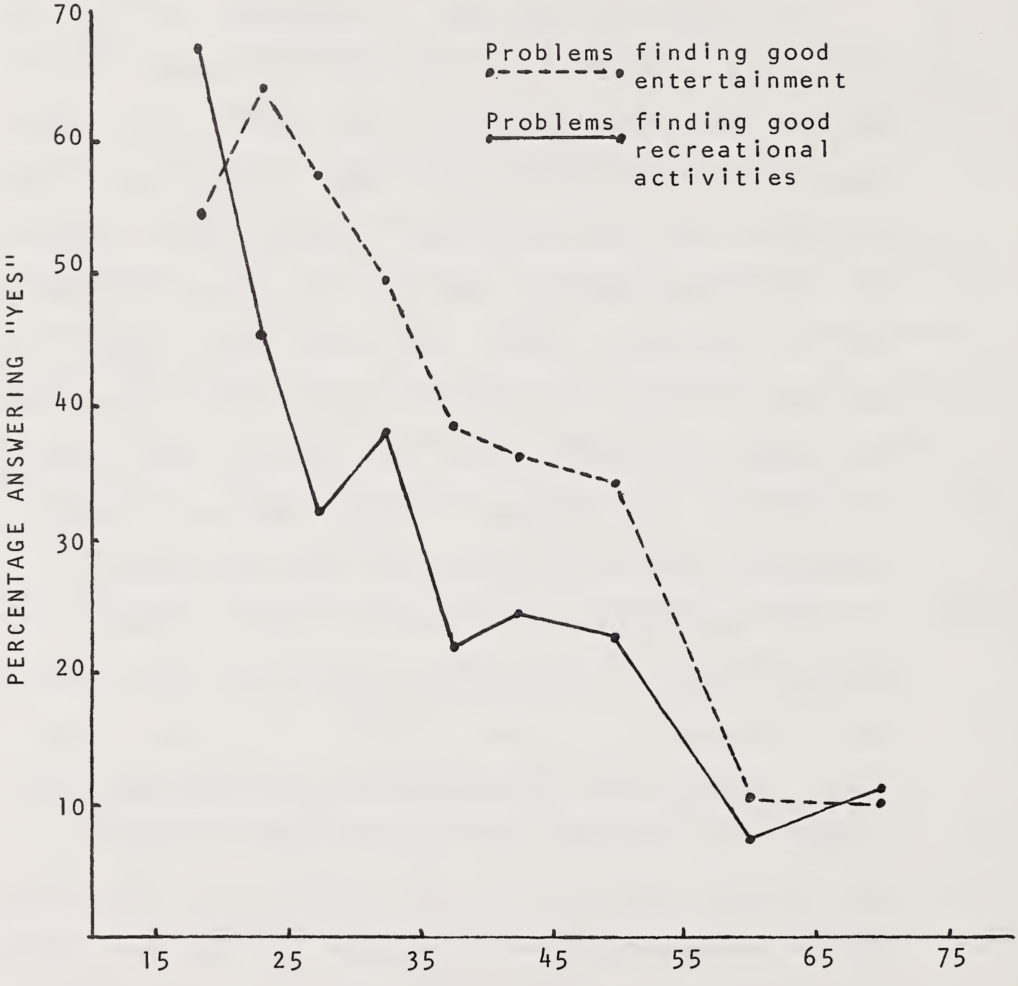
Finding good entertainment had been a problem in the past year for 38% of the sample (Table 7.2), while finding good recreational activities was considered problematic by slightly less than one third of the respondents (28%). Very similar percentages of respondents (42% and 31%, respectively) answered "Yes" to these two questions in a 1979 survey of Fort McMurray residents (Gartrell et al., 1980). Although Fort McMurray is larger than any of the communities in the study area, it is also a more isolated town. Whatever the differences, both surveys identified similar levels of dissatisfaction with entertainment and recreation facilities.

Differences by sub-area in responses to the question about entertainment are similar to those found for the question about shopping facilities (Table 7.2). Cold Lake respondents (56%) and those living in Grand Centre (46%) are much more likely to state that finding good entertainment has been problematic than are respondents from Bonnyville (32%) or the rural areas (27% and 34%). Again, younger respondents (who are more likely to live in Grand Centre or Cold Lake) may simply find the quality and quantity of available entertainment unsatisfactory while older respondents accept the situation less critically.

The same pattern of results is not apparent for the question about finding good recreational activities. Rural farm respondents are least likely to answer "Yes" (21%) while roughly the same percentages in the other four areas (between 27% and 34%) have experienced difficulty finding good recreational activities. Nevertheless, a more explicit test of the hypothesis linking age and service evaluation would be useful. The percentages of different age cohorts answering "Yes" to the entertainment and recreation questions are graphically displayed in Figure 7.1.

The relationship between age and the responses to these two questions is clear and unambiguous. Younger respondents are much more likely to report problems finding good

Figure 7.1 Problems Finding Good Entertainment and Recreation by Age[1]



[1] Sub-sample sizes are: ≤ 21 years (66); 22-25 (102); 26-30 (108); 31-35 (111); 36-40 (86); 41-45 (91); 56-65 (102); ≥ 66 (120).

entertainment and recreation. Of those under 22 years of age, 67% answered "Yes" to the entertainment item and 55% responded similarly to the item about recreational activities. The proportion answering "Yes", for both of these questions, drops quickly as age increases, levels off somewhat for the three age cohorts in the 36 to 55 year range, and then drops sharply again for the two oldest cohorts. As noted earlier when discussing shopping facilities, two factors can help explain this strong statistical relationship. Older respondents tend to report more satisfaction with most areas of their life. Second, the available recreation and entertainment facilities may actually be more satisfactory for older respondents while there may be a shortage of the kind of entertainment and recreation desired by younger residents.

As industrial development occurs in this area, the proportion of younger residents in the population will increase. It is primarily the young and middle-aged who are attracted to and can move easily to such development areas. This suggests that the proportion of residents having difficulty finding satisfactory recreation and entertainment may increase sharply.

7.3.3 Automobile and Household Repair Services

Nineteen percent of this sample replied that "getting a car fixed" had been a problem in the past year (Table 7.2). "Finding a good household repairman" had been problematic for 16% of the respondents. The differences across sub-areas are not as large and as systematic for these questions as they were for those discussed above. The exception is household repairs for Bonnyville residents (11%) compared to the other sub-areas (problem ratings ranging from 15% to 22%). Perhaps Bonnyville has more household repairmen. However, the fact that Bonnyville respondents report the fewest problems for six of the nine items in Table 7.2 suggests a tendency on their part to report experiencing fewer problems.

In the previously mentioned Fort McMurray survey, 31% of the sample had experienced problems with obtaining car repairs and 20% reported problems finding a good household repairman (Gartrell et al., 1980). The Fort McMurray results, obtained a year after the Syncrude project went into production, suggest that the communities in this study area may experience an increase in the shortage of skilled tradesmen, particularly during construction.

7.3.4 Vandalism, Theft and Problems with Juveniles

Problems of the kind identified in the above sub-title had been encountered in the previous year by 17% of the sample (Table 7.2). Again, a comparison with the Fort McMurray survey where 31% of the sample reported problems with vandalism, theft or juveniles in general, is instructive (Gartrell et al., 1980). Even the 24% of the rural non-farm residents (which includes the several villages in the study area) who answered "Yes" to this item do not approach the problem rate expressed by Fort McMurray residents. In that community, relatively more problems were reported by residents of high density housing developments, a finding which does not explain the highest rates for rural non-farm residents in the present study.

Bonnyville respondents are, again, least likely to report problems in this area (12% answered "Yes"). However, response patterns to several other questions about perceptions of community safety (Table 7.3) demonstrate that the sample members from Bonnyville may simply be less inclined to answer "Yes" to the service-problem questions. Bonnyville residents are actually less likely than other respondents to report feeling "reasonably safe" or "very safe" when walking alone in their neighbourhood at night. Similarly, they are more likely to keep their doors locked when at home or when away from home.

Looking further at the response distributions in Table 7.3, it is fairly clear that rural farm respondents are most likely to report feeling safe walking alone, and that all rural residents are less likely to feel it necessary to lock their doors.

A 1979 survey of 1414 residents of Edmonton revealed that 29% felt "unsafe" walking alone in their neighbourhood at night. Seventeen percent chose the "neutral" response category while 54% reported feeling "safe" (Kennedy,1979:36). In our survey of the Cold Lake-Bonnyville area, we find that even the combination of "very unsafe" and "somewhat unsafe" accounts for only 17% of the total sample. Thus, although there are some differences within the study area, we can still conclude that perceptions of community safety are relatively high. The really interesting comparison awaits a survey of the study area following the construction of the oil extraction plant.

7.3.5 Medical and Dental Services

Getting medical or dental treatment was considered a problem by 13% of the sample. We find no important differences between sub-areas (Table 7.2). In another question in a different part of the interview schedule, respondents were asked how often, in the past twelve months, they had seen a doctor. The average for the total sample was 4.9 with the Bonnyville average (6.7) being the highest. The low incidence of reported problems in this community does not appear to be a function of low use of services. This suggests that residents of that community are probably giving a relatively accurate description in their low problem-rate for medical and dental treatment (9%).

7.3.6 Financial Problems

Problems in writing or cashing a cheque and in borrowing money were reported by six percent of the survey respondents (Table 7.2). One of the differences between an area with many long-time residents and a community of relative newcomers like Fort McMurray is the greater ease of cheque-cashing and writing in the former. Nineteen percent of the Fort McMurray respondents reported experiencing problems in this regard (Gartrell et al., 1980), probably because they were less likely to be known in banks and other places of business.

7.4 Direct Evaluations of Community Services

7.4.1 Total Sample Results

Along with the question about problems encountered in obtaining various community and privately-provided services, respondents were also asked to directly evaluate the quality of twenty specific services. Responses from the original seven-point ("very poor" to "very good")scale were transformed into a zero to one hundred scale to allow easy comparison. The results for the total sample, ranked by degree of positive evaluation, are presented in Table 7.4 along with the differential results for the five sub-areas within the study area.

Evaluation scores for the total sample ranged from scores above 65 for telephone, utilities, schools, public health and ambulance services to a low of 20 for day care services. Earlier in this chapter (Table 7.1) we noted that only a small proportion of respondents with children (4%) reported using day care services. The very low rating given to these services (Table 7.4) is probably more a reflection of their absence than of their poor quality.

Table 7.4 Service Evaluations[1] by Locale

Service	Cold Lake	Grand Centre	Bonnyville	Rural farm	Rural non-farm	Total[2]
	Averages (X/100)					
Telephone	72.8	74.8	82.5	69.8	73.3	75.5
Utilities	69.7	72.0	76.7	73.5	67.0	72.8
Schools	66.3	66.8	75.0	74.3	73.0	71.5
Public health	68.8	67.0	74.0	72.8	61.5	70.0
Ambulance	72.0	55.2	77.7	69.3	64.7	68.8
Police	61.5	67.3	68.0	61.7	57.3	64.2
Fire protection	74.2	62.7	75.0	48.2	49.2	63.8
Shopping	47.7	49.3	72.7	69.5	62.8	61.5
Public library	63.2	67.5	65.8	54.7	41.0	60.8
Doctors	54.8	56.2	65.5	62.7	59.7	60.5
Dentists	49.2	61.7	69.5	59.0	52.3	60.5
Services for the elderly	57.7	45.0	66.8	64.5	60.5	60.0
Parks	68.2	47.2	63.2	59.8	58.0	59.2
Snow/ice removal	50.3	45.7	59.0	67.3	63.0	56.8
Hospital	55.7	48.2	59.0	56.7	55.0	55.2
Street/road repair	44.0	39.3	63.2	57.7	52.2	52.3
Counselling	45.2	48.7	58.0	52.8	42.0	51.3
Recreation	43.3	40.7	44.7	48.8	51.2	45.2
Downtown parking	50.7	29.5	30.8	37.2	47.7	37.0
Day care	15.8	26.8	10.3	31.8	20.3	20.0

[1] Original seven point ("very poor" to "very good") scale transformed into a zero to one hundred scale.

[2] Sample sizes range between 861 and 937 except for public library (784), services for the elderly (814), counselling (748), and day care (580).

Police protection and fire protection both received relatively positive evaluation scores (64) from the total sample, as did shopping facilities (62). While finding a particular product or article had been a problem for almost one-half of the respondents (Table 7.2), shopping facilities in general still received fairly positive evaluations.

Since only 13% of the sample had experienced problems in the past year in obtaining medical or dental treatment (Table 7.2), the moderately positive evaluation of doctors and dentists (61) is as expected. Public library services received the same score, but the lower number of respondents for the item (N = 784) suggests that a sizeable proportion of the sample were unsure how to evaluate this service. Earlier we saw that only about one-fifth (21%) of the respondents had used the library system in the year previous to the interview.

Services for the elderly received a score of 60, parks were evaluated with an average score of 59, and snow/ice removal was given a somewhat lower score (57). Hospital services, with an average evaluation score of 55, do not appear to be viewed with a great deal of satisfaction. If the population of the area increases as quickly as is expected, producing the same strains on medical services as occurred in other Alberta resource towns during their construction booms (Van Dyke and Loberg, 1978), it may be safe to predict an even lower level of satisfaction when the major development projects get under way. Improvement and expansion of present facilities might, of course, lessen this negative impact.

Street and road repairs and counselling services both received average evaluation scores just slightly over 50 out of the possible 100. In the 1979 survey of Fort McMurray (Gartrell et al., 1980), snow/ice removal and street and road repairs were both given much lower average scores (33 and 22, respectively). Because of the rapid growth of that town, adequate upkeep and repair of roads appear to have been difficult to maintain. When wide-scale housing construction begins in any of the communities in the study area, similar problems may be experienced. The degree to which such problems are reduced by the development of a larger geographic area (as compared to Fort McMurray) is difficult to determine in advance.

Finding good entertainment and recreation were two of the most frequently encountered problems discussed earlier (Table 7.2). Recreation facilities, in general, also received a low average evaluation score (45) from this group of respondents (Table 7.4). Another comparison to Fort McMurray, where a substantial amount of money has been invested in community recreation facilities and where recreation facilities received a much higher evaluation score of 69 (Gartrell et al., 1980), highlights one of the potential benefits of sudden development. Provision of recreational facilities is probably an easier service void to fill (if money from various levels of government is available) than is the absence of good medical services, for example.

Finally, downtown parking received a very poor evaluation (an average score of 37), with only the already-discussed day care services having a lower score (20). Population increases in the various communities is not likely to lead to an increase in the level of satisfaction with parking in their downtown areas.

7.4.2 The Use and Evaluation of Services

We have already mentioned that the use of particular community services might influence their subsequent evaluations. A test of that hypothesis, using the nine services for which questions about usage were asked, is presented in Table 7.5. The average evaluation scores (on the zero to one hundred scale) for those who had used the particular service within the previous year are compared with average scores for non-users.

Those respondents who had called the fire department (including requests for fire inspections) in the previous year evaluated fire protection services less positively (mean = 59) than did non-users of this service (mean = 64). While the difference is not statistically significant, a similar difference in evaluation of police services is too large to be considered a product of chance. Respondents who had called the police rated them more poorly (mean = 58) than did those who had not required their services (mean =

67). The explanation that, after being called, police officers had not performed their duty satisfactorily is plausible but not as probable as an alternative explanation. Police officers (and fire officers) are often in the peculiar position of being considered most effective if they never need to be called for help. Respondents in this survey who had called the police probably reasoned that, if police services were adequate, the calls would have been unnecessary. This interpretation is partially supported by the fact that only 25% of those respondents not reporting problems with theft, vandalism and juveniles had called the police within the past year. Of those who had encountered such problems, 61% had called the police.

Users of utility maintenance services, as well as public health and counselling services, evaluated these services significantly more positively than did non-users (Table 7.5). The other relationships between use and evaluation of services presented in this table are in the same direction - users provide more positive evaluations - but are not statistically significant.

Having noted earlier that Bonnyville and rural residents tended to be more positive in their evaluations of services, we concluded that differences in age and length of residence in the study area might be responsible. An alternative explanation might focus on differences by locale in level of use of services. There is some support for this argument. For example, rural non-farm respondents were most likely to have called the police (Table 7.1) and most inclined to evaluate them poorly (Table 7.4). Similarly, Bonnyville and rural farm residents used counselling services more often than other respondents (Table 7.1) and also gave them more positive evaluations (Table 7.4). However, not all the relationships fit this pattern. Bonnyville residents rated public health services most positively (Table 7.4) but were exceeded in use of this service by three other sub-areas (Table 7.1) Thus, although some of the differences in average service evaluations between sub-areas may be a function of different levels of use, the demographic explanation (differences in age and length of residence) cannot be totally discounted. This explanation is addressed further in the following section.

7.4.3 Service Evaluations and Demographic Factors

Although a one-way analysis of variance was calculated for each combination, the relationships between four demographic variables (sex, age, education and length of residence in the study area) and the twenty service evaluation variables are too numerous and complex to portray in tabular form. However, the results are briefly summarized below.

Statisticallly significant relationships ($p < .01$) between sex of respondent and service evaluation were found for only five of the twenty services listed in Table 6.4 (public health, parks, streets and roads, recreation facilities, and day care services). Women were more likely than men to evaluate public health services positively, and more likely to rate the other four services negatively.

Age, on the other hand, was significantly associated with evaluations of all but three of these services (public health, police and dentists). In each case, older respondents tended to give the service a more positive evaluation. Longer-term residents of the study area also were generally more positive in their assessments of community services. They gave significantly higher ratings to all but four of the services listed (library, police, dentists, and day care). Finally, education and service evaluation were significantly negatively related for 18 of the 20 services considered. Less educated respondents gave high evaluations to all community services except for dentists and day care. Education is clearly related to age in this sample (r = -.524) as well as to length of residence in the study area (r = -.464). To complete the picture, age and length of residence are strongly associated (r = .640).

There is considerably more support for the argument that differential service evaluations by locale are a function of demographic differences (age, education and length of residence) than for the alternative argument that differences in level of use are responsible. With respect to length of residence in the study area, two explanations may be appropriate. The relationship may, very simply, be a product of the process whereby satisfaction increases with age and time spent in one place. Alternatively. it may be produced because respondents who have always lived in the study area are more positive in their evaluations than are all other respondents (who may have experienced life in more "developed" urban centres). One-way analyses of variance for all twenty of the services were calculated to test this hypothesis. Only three of the relationships were statistically significant ($p < .01$). Respondents who had always lived in the study area evaluated shopping facilities, snow/ice removal, and services for the elderly more positively than did respondents who had lived outside of the area for some time. To some extent, then, area residents who have not experienced life in other communities tend to be more satisfied with community services. However, this explanation is not sufficient for the many other services considered. With respect to those services, two explanations compete. In some cases (recreation and shopping facilities, for example), the available services might not be attractive to younger, better-educated residents, or may not be adequate for them (e.g. day care services for younger respondents with children). In other cases (e.g. parks) increased use may lead to greater satisfaction.

7.5 Summary

It is important to consider current levels of use and evaluation of community services since sudden and large increases in population associated with industrial development will, almost certainly, place strains on service delivery systems. Other data sources can probably provide more detailed records of service use. The survey data on service use is employed primarily as a statistical control on service evaluations. These community service evaluations were obtained in two forms:

1. "Yes" or "No" answers to questions about service-related problems encountered in the previous year; and
2. responses on a "very poor" to "very good"scale for each of twenty community services listed.

Almost one-half of the respondents reported problems associated with shopping (finding specific products or articles). Finding good recreation or entertainment were also given fairly high "problem ratings". Problems in obtaining household and automobile repairs, and problems of vandalism and theft were reported by between 15% and 20% of this sample of study area residents. However, a comparison to 1979 survey results from Edmonton revealed that study area residents are still more likely to consider their community a safe place to live than are Edmonton residents.

Thirteen percent of the sample had encountered problems obtaining medical or dental treatment. In the second set of service evaluation questions, doctors and dentists received moderately positive evaluations, about equally as high as police and fire protection, shopping facilities, libraries, parks and services for the elderly. Telephone, utility maintenance, schools, public health and ambulance services were given somewhat higher average evaluations by the total sample of respondents.

Snow/ice removal, street/road repair and downtown parking received relatively poor evaluations, as did hospital and counselling services. Recreation facilities were also evaluated poorly but day care services were rated considerably lower than all other services.

Comparisons to a 1979 survey of Fort McMurray revealed that, although similar percentages of the total sample reported problems finding good recreation and entertainment, recreation facilities were ranked considerably higher by Fort McMurray respondents. However, Fort McMurray residents were more likely to report problems with vandalism and theft, and with obtaining household and automobile repairs. They were also considerably less positive in their evaluation of street maintenance and repair. Expected rapid population increases in the study area may lead to reduced satisfaction with services such as these.

A tendency was noted for Bonnyville and rural residents to evaluate services more positively than Cold Lake and Grand Centre residents. While this might reflect better service provision in these areas, other explanations are also probable. Respondents who use services more frequently may tend to evaluate them more positively. An inspection of relationships between use and evaluation of services revealed some support for this hypothesis. However, the level of service use in Bonnyville and the rural areas was not systematically associated with service evaluations.

An alternative and better-supported explanation focuses on demographic differences between sub-areas. Bonnyville and rural residents are older and are more poorly educated. They have lived longer in the study area than have Cold Lake or Grand Centre residents. A strong and consistent relationship exists between these demographic characteristics and service evaluations. Thus, Bonnyville and rural residents may tend to evaluate services more positively simply because older people are often more satisfied with various aspects of their lives. Alternatively, some of the community services and facilities may be more oriented towards an older population. Entertainment and recreation facilities, for example, may be considered satisfactory by older residents of the area but inadequate by younger residents with different interests. Entertainment and recreation are discussed in more detail in the following chapter. However, the implication of the relationship between their evaluations (and the evaluation of other services) and demographic characteristics of the study area population must be highlighted here. The individuals who will be attracted to the Cold Lake-Grand Centre-Bonnyville area as development proceeds will generally be younger and better educated than many current residents. If younger, better-educated, shorter-term residents tend to find community services less satisfactory, general levels of satisfaction with services in the study area may decrease.

8. LEISURE AND RECREATION

8.1 Introduction

Leisure-time activities and recreational pursuits of respondents are the primary topics discussed in this chapter. The term "non-work activities" is used at some points to allow inclusion of activities like church attendance or attendance at club or organization meetings. These more formal behaviours are not always classified as leisure-time activities. They are included in this chapter since its intent is to provide a broad overview of the non-work interests and activities of present residents of the study area.

This topic received some attention in Chapter 7 where community service evaluations and service-related problems were discussed and analyzed. Younger, better-educated respondents who had lived in the study area for a longer time were, generally, least satisfied with entertainment and recreation facilities. These differential evaluations produced noticeable differences by location within the study area. Thus, Bonnyville and rural residents (who are generally older and less educated) usually reported fewer problems finding good entertainment and recreation and were less likely to evaluate recreation services negatively.

One of the partial explanations presented in chapter 7 emphasized the differing recreational and entertainment interests of various age and educational categories of respondents. Here we address this argument in more detail.

8.2 Non-work Activities

8.2.1 Total Sample Results

A rough profile of the non-work interests of study area residents can be derived from answers to a series of questions about activities in the four weeks prior to the interview. Average responses from the total sample to these "How often in the past four weeks...?" questions are listed in the last column of Table 8.1.

Respondents had attended church an average of 1.85 times in the month prior to the interview but had been to an average of only slightly more than one club or organization meeting in that time. Entertaining at home (mean = 3.59) was clearly a more popular leisure-time activity than was eating out in a restaurant (mean = 2.88) or going to a bar or lounge (mean = 1.22). All three of these activities were reported much more frequently than were attendance at movies (mean = 0.39) or at cultural activities such as plays or concerts (mean = 0.16).

The very low level of attendance at movies, plays and concerts may reflect a relative dirth of these activities in the study area. It may also be an indication of the non-work interests of the residents of this area. A comparison to results from similar questions asked in a 1979 Fort McMurray survey (Gartrell et al., 1980) reveals that residents of that community were much less likely to attend church (mean

= 0.86 times in four weeks) but somewhat more likely to entertain at home (mean = 4.03), go to restaurants (mean = 4.09), bars (mean = 2.14), movies (mean = 0.75) or cultural events (mean = 0.42). Frequency of attendance at club or organization meetings (mean = 1.04) was fairly similar in the two studies. A major difference between the two groups, as noted earlier, was the relative youth of the Fort McMurray sample. The differences in non-work activities and interests of the two groups are probably, to a large extent, a function of this difference in age.

8.2.2 Area Differences

If, as suggested above, differences in participation in various non-work activities are produced by age differences between sampled populations, participation differences should be found between the sub-areas of the study area which have clearly identifiable demographic differences. Column comparisons in Table 8.1 support this hypothesis. Bonnyville and rural farm residents are much more likely to attend church than are residents of the other sub-areas. Cold Lake and Grand Centre respondents are more likely to report frequent use of restaurants and bars or lounges and frequent attendance at movies. In fact, going to a bar or lounge appears to be a more popular form of entertainment in Cold Lake (mean = 2.79 times in four weeks) and Grand Centre (mean = 2.65 times) than in Fort McMurray (mean = 2.14 times), a community with a reputation considerably less demure than that of either of these towns.

Entertaining at home differs little across sub-areas with averages between 3.2 and 4.1 for all five locales considered. Although Bonnyville and rural farm residents are several times as likely to report attending cultural activities as are other respondents, the averages for these locales are still very low (means of 0.25 and 0.24). The larger and more important differences between areas are found for the other five non-work activities listed in Table 8.1. These five activities are examined in more detail below.

8.2.3 Demographic Differences

One-way analyses of variance, for each of church attendance, club or organization meetings, restaurant, bar or lounge and movie attendance, were calculated using a variety of independent variables. Sex of respondent was not significantly associated ($p < .01$) with frequency of participation in these activities except for more frequent patronage of restaurants and bars by men. Marital status (spouse present/not present) was also an unimportant predictor except for similar higher levels of use of restaurants and bars by unattached respondents.

Because length of residence in the study area and age are strongly correlated ($r = .640$), the relationships between these variables and frequency of participation in non-work activities are similar. Consequently, only respondents' age is used as an independent variable in Table 8.2. Unreported analyses using length of residence produced very similar results.

Differences in social status (income or education, for example) are often found to explain differences in choice and frequency of leisure-time activities. Respondents' education is the second explanatory variable used in Table 8.2. It was chosen instead of total 1978 household income because of the larger amount of missing data on this second indicator of social status. Total household income and education are moderately correlated ($r = .442$; $N = 714$), resulting in similar relationships with the five frequency of non-work activity variables.

The relationships between age and frequency of non-work activities (Table 8.2) are clearly interpretable. Younger respondents are much more likely to eat in restaurants, go to bars or lounges, or to attend movies. The various age cohorts under age 40 had eaten in a restaurant between three and five times in the month previous to the interview. Those over 40 had patronized restaurants considerably less often. A similar pattern exists for frequenting of licensed premises, except the split between frequent and less frequent use appears to occur around age 25. Movie attendance for the total sample is quite low (Table 8.1) but it is particularly low for respondents over age 35. Older residents of the study area are most likely to attend church frequently. Those over 65 report an average of almost four compared to averages between one and two for middle-aged respondents and averages of less than one church attendance in the previous four weeks for respondents under age 25.

Middle-aged respondents, as would be expected, report more frequent attendance at club or organization meetings. Organizational participation increases as people settle into their occupations and careers and decreases as retirement approaches. Higher education, however, leads to increased organizational paticipation. Respondents with ten to twelve years of completed education had attended an average of approximately one meeting in the previous month. Less educated respondents reported considerably less participation while those with post-secondary educations were noticeably more active in this respect.

Church attendance decreases with education while patronage of restaurants and bars increases (Table 8.2). The same pattern exists for movie attendance except for the noticeable drop (from 0.56 to 0.26) in average attendance from the second highest to the highest education category. An easy explanation is not quickly apparent. Highly educated residents of the study area may not find the choice of available movies in the area satisfactory.

The similar relationships of age and education with frequency of use of restaurants, bars and movie theatres suggests that individuals who patronize one are likely to patronize others as well. An examination of correlations demonstrates that this is true for this sample (Table 8.3).

The patronizing of restaurants and the patronizing of bars or lounges are positively correlated (r = .281) as are bar/lounge patronage and movie attendance (r = .266). Those respondents who eat frequently in restaurants are also more likely to go to movies (r = .196).

In brief, different demographic categories of the study area population have different non-work interests and engage in different leisure-time activities. As the expected demographic transition produced by petroleum-based development occurs, a change in the non-work time activity profile of the study area can be expected.

8.3 Recreational Activities

Because several specific recreation-oriented questions were asked with a different format than the questions discussed in Section 8.2, recreational activities of study area residents are analyzed separately here. Respondents were asked to respond with one of five possible answers (Never; Seldom; Sometimes; Often; Very Often) to three questions:

1. "How often do you play team sports (e.g. hockey, soccer)?"
2. "How often do you participate in non-team sports (e.g. tennis, badminton)?"; and
3. "How often do you exercise just for the sake of exercise?"

8.3.1 Total Sample Results

Over 60% of the total sample answered "Never" to the question about team sports (Table 8.4). This same response was chosen by 55% of the respondents for non-team sports, and by 30% for "exercise for the sake of exercise". Alternatively, 25% answered "Often" or "Very Often" with reference to exercise activities while only one-half as many answered similarly for team sports (13%) and non-team sports (12%). Most team and non-team sports require some recreational gear, the availability of facilities, and so on. Simple exercise (e.g. walking for exercise) is less difficult to organize. This difference may account for some of the large difference in levels of participation in these recreational activities.

8.3.2 Area Differences

The expected differences by area - less recreational activity for Bonnyville and rural residents - are again found (Table 8.4). Over 65% of the respondents from these locales (compared to under 55% for Cold Lake and Grand Centre) answered "Never" to the question about team sports. Less than 50% of the Cold Lake and Grand Centre respondents in this sample chose "Never" as their response to the question about frequency of participation in non-team sports while 63% of the other respondents answered in this way. The same pattern exists for responses to the "exercise for the sake of exercise" question, although the differences, with one exception, are not as large. Farmers are much less likely to answer "Never" to this question (39%) than are other respondents (percentages ranging from 22% to 31%).

8.3.3 Other Differences

Our previous analyses in this chapter and chapter 7 suggest that age, length of residence in the study area, sex and education of the respondent, and household income might be related to frequency of recreational activity. The responses to these three recreational-activity questions were coded on a (1 - 5) scale and used as dependent variables in multiple regression analyses employing the above five demographic and social status variables as potential predictors (Table 8.5).

Length of residence in the study area was not significantly associated with any of the dependent variables once age of respondent was controlled. Total 1978 household income had a significant effect only on frequency of playing non-team sports. However, education and sex of respondent were statistically significant predictors in all three step-wise regression analyses. Age did not have an effect on frequency of exercise, controlling on sex and education, but it was significantly related to the other two dependent variables (team sports and non-team sports). More detailed analyses of the relationships between recreational participation and age, education and sex of respondent are presented in Table 8.6.

Older respondents are considerably less likely to report engaging in team sports or non-team sports. The direction of the relationship between age and frequency of exercising is not as clear. In fact, there is some evidence that both younger and older respondents are more inclined to exercise just for the sake of exercising than are middle-aged (ages 36 to 45) residents of the study area.

Participation in all three recreational activities increases with education, but the relationship is not nearly as strong for exercise as it is for team and non-team sports. Men are more likely to engage in sports (both team and non-team) while women report a slightly higher level of exercise activity than do men.

Summing up, we again find that different demographic groups within the study area engage in different recreational activities. Younger, more educated respondents are more likely to participate in sporting activities as they were also more likely to attend movies, eat in restaurants and patronize bars and lounges. As the relative proportion of younger, better-educated area residents increases with development, the need for more recreational and entertainment facilities for this group will increase.

8.4 Satisfaction with Non-work Activities

All respondents were asked how satisfied they were with their "non-working activities - hobbies and so on?" Twenty-eight percent of the total sample answered "Very satisfied" on a seven-point dissatisfaction-satisfaction scale. Only 3% chose the "Very dissatisfied" response category. The average score on this (1 - 7) scale was 5.3.

Responses to this question were not significantly correlated with sex, marital status or education of respondents, or with total 1978 household income ($p > .01$). Older respondents and longer-term residents of the study area reported significantly more satisfaction but the relationships were very weak (correlations of 0.133 and 0.093 respectively). Given this relative absence of demographic correlates we would expect few large differences across sub-areas in responses to this satisfaction question. The average scores for each locale (transformed into a zero to a one hundred scale) are presented in the top half of Figure 8.1.

Rural residents of the study area report slightly more satisfaction with their non-work activities (average scores of 76 and 74) than do Bonnyville and Grand Centre residents (average = 71) or residents of Cold Lake (average = 69). While Bonnyville respondents resemble rural residents more closely in demographic characteristics and both entertainment/recreation interests and evaluations (see chapter 7), they are, like other non-rural sample members, a little less positive in their subjective self-evaluations.

Figure 8.1 also contains average responses to this question from 1979 surveys in Edmonton and Fort McMurray. The average for the total Cold Lake study area (72) is clearly closer to the Fort McMurray average (73) than to the Edmonton average (78). Edmonton has many more entertainment and recreation facilities than do either Fort McMurray or the Cold Lake-Bonnyville area. This difference may partially account for the difference across communities portrayed in the bottom half of Figure 8.1. This explanation receives some support from the fact that similar percentages of Fort McMurray respondents (Gartrell et al., 1980) and Cold Lake study area residents (see chapter 7 of this report) reported experiencing problems finding good entertainment (42% and 38% respectively) and good recreational activities (31% and 28%).

8.5 Summary

A preliminary non-work activity profile of study area residents has been provided in this chapter. Respondents had entertained at home an average of over three times in the previous four weeks, had eaten in a restaurant an average of almost three times, and had attended church an average of almost twice in that time. Attending club or organization meetings or going to a bar or lounge had average scores of a little more than one, while attending movies or cultural events were reported much less frequently. Over three-fifths of the sample said that they never participated in team sports. Over one-half gave the same answer with regard to non-team sports such as badminton or tennis, and about one-third said they never exercised just for the sake of exercise. Alternatively, about one-quarter of the sample said they exercised often or very often, and approximately one-eighth participated often or very often in team sports and non-team sports.

Different demographic categories of the study area population have different non-work interests and engage in different leisure-time activities. Younger respondents are considerably more likely to patronize restaurants, bars and movie theatres. They also report more frequent participation in team and non-team sports. Older residents of the study area are much more likely to attend church frequently. The old and the young report more frequent exercise activity than do the middle-aged who, on the other hand, are more likely to report attendance at club or organization meetings.

Better-educated respondents attend church less frequently but go to more club or organization meetings. They also patronize restaurants and bars more often and are more likely to participate in team and non-team sports. Since younger respondents are also usually more educated, it is difficult to specify complete causal linkages. However, it is apparent that as the relative proportion of younger and more educated residents of the Cold Lake region increases, the need for more entertainment and recreation facilities for this group will increase.

Because of relatively large demographic differences within the study area, we find substantial differences in non-work activity patterns when we compare sub-areas. For example, Bonnyville and rural residents are more likely to attend church frequently, and less likely to go to bars or movies or eat in restaurants. They are also less likely to participate in either team or non-team sports or to engage in other exercise activities.

Rural residents, despite their lower participation rates, report higher satisfaction with their non-work activities than do residents of the towns in the study area (including Bonnyville). Comparisons to Edmonton and Fort McMurray survey results show that Edmonton residents, on the average, are somewhat more satisfied with their non-work activities than are residents of either Fort McMurray or the Cold Lake study area. The larger number and greater variety of recreation and entertainment facilities in the larger community may be partially responsible for this difference.

9. FAMILY LIFE

9.1 Introduction: Family Life and Resource Development

Much of an individual's growth and development, even as an adult, occurs within the framework of the family (Larson, 1979). Major psychological needs are frequently better met within the family than in less "primary" settings such as government agencies provide. The family can serve as a buffer in disruptive social settings, and marriage can help mitigate the psychological effects that economic and social problems may otherwise create (Perlin and Johnson, 1977).

Riffel sees problems of family adjustment to life in a resource town as one of the most important sources of turnover (Riffel, 1975:61). However, as Larson notes in reviewing the literature, there has been little systematic research on the effects of the resource development process on the family life of its participants. Reports about life in places like Fort McMurray detail a great deal of marital discord and family breakdown (Van Dyke, 1975; Graham, Brawn and Associates, 1975; Van Dyke and Loberg, 1978; Hobart, Walsh and Associates, 1979). Loneliness, depression, alcohol related problems, marital infidelity, and debt are commonly experienced. Supportive relatives are far away, and government family services are unequal to the task.

This gloomy picture is drawn from indirect secondary sources (Larson, 1979) and the opinions of members of the helping professions (Graham, Brawn and Associates, 1975; Van Dyke, 1975). These opinions are shared by the residents themselves (Gartrell et al., 1980). Yet marital satisfaction was reported to be high and families appeared to have adjusted well to the circumstances they found in Fort McMurray (Gartrell et al., 1980).[17]

Given the reputation of boom-towns as notoriously unstable (Lucas, 1971), it is important to provide an assessment of the pre-impact effectiveness of families in responding to pressures placed upon them by rapid change. This assessment includes description and analysis of:

1. The structure of family life in the study area;
2. The patterns of marital interaction (role flexibility, communication, disagreements);
3. Fertility behaviour, family building, and problems in raising children;
4. The quality of family life and attitudes towards the area as a place to settle permanently and raise a family.

9.2 Family Structure

9.2.1 Marital Status

Resource towns usually contain a relatively high proportion of unattached adults. Rural and small town areas generally exhibit a relatively low proportion of single adults and a high proportion of married adults. Many young, single adults leave these areas for education or employment opportunities in metropolitan areas. This pattern is confirmed by a comparison of the study area with other communities in Alberta as well as with national census returns. In Canada as a whole (1976), 11% of household heads were never married. This proportion is almost identical to that found in the study area (Table 9.1).

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[17] It may well be the case that families that had difficulty left Fort McMurray in disproportionate numbers. The "stayers" would then have been relatively well adjusted. Without a pre-impact assessment and longitudinal panel and cross-sectional research designs, such questions can never be satisfactorally answered.

Survey results for 1979 show that both Fort McMurray (17.7%) and Edmonton (21.4%) have appreciably higher proportions of single residents than does Canada as a whole. The general population of the Cold Lake region has a higher marriage rate (72.1% married, 5.2% common-law, 3.1% separated) than either Fort McMurray or Edmonton (Table 9.1). In this respect, the proportion of married is higher in the study area than in Canada as a whole. Nationally, 75.6% of household heads were married, living common-law or separated (Canada Year Book, 1978-79: 163). The Cold Lake region has a lower proportion of divorced respondents (2.4%) than Fort McMurray or Edmonton (Table 9.1), and this proportion is also slightly lower than figures for the nation as a whole (3.1% were divorced). The Cold Lake region had a similar proportion of widowed to that reported in survey results for Edmonton. These figures are low compared to Canada as a whole (10.4%) in 1976.

Community comparisons in Table 9.1 show that the urban areas (Cold Lake, Grand Centre, and Bonnyville) have lower percentages of married and higher percentages of single, common-law, and widowed than do the rural areas. The highest proportion of married was recorded for the rural farm population. Bonnyville had the highest proportion of marital statuses that might indicate family problems (separated, divorced, widowed). Differences between communities may be in part a product of age structure, particularly with regard to never married and widowed respondents.

9.2.2 Household Size

Average household size for the study area was 3.2, slightly larger than both the provincial and national 1976 averages of 3.1. About 12% of the households surveyed in the study area contained one person, and 29% contained two people. A further 19% contained three people, 20% contained four, and 19% had five or more. The slightly larger household size in the study area (vis-a-vis provincial and national figures) was primarily a product of a larger number of children. Households in the study area averaged 1.13 children compared to 1.07 for Alberta, and .98 for Canada.

Household size varied considerably over the different areas in the Cold Lake region (Table 9.2). Rural farm and non-farm populations reported the highest average sizes (3.82 and 3.27, respectively), while smaller household sizes were recorded in Cold Lake (2.98), Bonnyville (2.91), and Grand Centre (3.12). Besides being a product of differential age and marital status composition, these differences also reflect the number of children in the household (Table 9.2).

The total sample for the general population of the study region (N=940) contained only 26 households where there was a single adult with children present. By this definition, there were too few "single parent" families to allow detailed analysis.

9.2.3 Differences by Marital Status in Selected Indicators

Further review of differences by marital status showed that, as expected, widowed and married respondents had lived in the region the longest (averaging 36 and 21 years respectively). However, even never married and common-law respondents had lived in the area a relatively long time, averaging 16 and 9 years respectively (Table 9.3). The married respondents owned more household possessions, and were more likely to live in single family dwellings. Indeed, a relatively high 84% of the married in the Cold Lake region lived in single family housing. Even when the common-law respondents are included, 82% of that sub-sample lived in single family dwellings. Survey results for Edmonton showed 66% of the married and common-law respondents living in single family housing. Comparable figures for Fort McMurray (Gartrell et al., 1980) showed only 34% living in single family housing. Even if mobile homes are included for Fort McMurray, this raises the percentage to only 58%. One of the effects of rapid development in that community was a change in housing composition towards a higher proportion of multiple family dwellings in newer housing stocks (Nichols and Associates, 1979).

As expected, average household size was largest for married respondents (3.6), but was only slightly lower for those with common-law marital status (3.0). This difference was largely a result of fewer children born to respondents (1.3 versus 3.1). It was counterbalanced somewhat by the presence of some children born to other adults in the household, and a higher likelihood of there being other adults besides the co-habiting couple present in the household.

In the general population of the study area, 25 respondents (3%) had been married in the year prior to the survey, and 29 (3%) had been separated or divorced. About 7% had had a baby, and 25% had someone move in or out of the house. Indeed, 25% had changed residence themselves. Twenty-seven percent of the sample had experienced the death of someone close to them.

A life events stress index was formed by adding the number of these major life events to others primarily dealing with work and illness. This simple count of events, 16 in all, showed that the married actually reported far fewer stress events (averaging 1.9) than did any other marital status except the widowed (averaging 1.4). Those who were separated reported an average of 4.2 events, and those who were living commonlaw reported an average of 4.1. People with these marital status categories form a relatively small proportion of the population (8% in all), but they appear to experience far more stress-producing events than do the married. In addition, the married are presumably better able to cope with the stress (Perlin and Johnson, 1977; Larson, 1979).

9.3 Social Characteristics of Couples

The 678 married and the 49 common-law respondents were combined in an analysis that stressed living arrangements rather than legal status. For the remainder of this analysis, these respondents will be referred to as "couples" or simply "married".

Couples had lived together an average of over 18 years, and about 10% of this sub-sample had been married previously. In 41% of those families, the wife was currently employed at least part-time, and household incomes averaged about $18,700 (compared to $17,400 for the whole sample). Average length of residence in the Cold Lake area was over 20 years, but 15% of the married sub-sample had moved to the region in the two years prior to the survey (Oct. 1977 to Oct. 1979). A further 16% had come between Oct. 1974 and Oct. 1977. The high stability of the area is indicated by the fact that one-half of these couples had come to the region in 1967 or earlier. Indeed, about 32% migrated to the area before 1952 when CFB Cold Lake was built, and 20% lived in the area prior to the outbreak of WWII.

In the married sub-sample, about 25% claimed fathers of English, Irish or Scottish ethnicity, 19% were French, and 13% designated their father's ethnic status as "Canadian". These three largest ethnic groups formed only 57% of the population, indicating the wide ethnic diversity present in the region. The area was also relatively heterogeneous in terms of religious affiliations. Of the married sub-sample, 36% were Roman Catholic, and an additional 36% indicated that they were United or Anglican.

Fertility was generally high, and a large proportion of the couples reported that they expected no more children. This is largely a consequence of the age composition of the area. While 13% had no children, only 5% expected to remain childless, and a further 4% expected to have only 1 child. Eleven percent of the couples had one child, 21% had two, and 22% had three. A further 19% had 4 or 5 children, and 13% had 6 or more. Couples that expected two (27%) or three (27%) children were the most frequent, but a further 24% of the couples expected 4 or 5, and 13% expected 6 or more. Much of this high level of fertility reflected the relatively large proportion of the wives (38%) who were over 45 years of age, and had completed their families.

9.4 Patterns of Marital Interaction

Marital interaction, communication, and role flexibility are important to the ability of families to adapt to both minor and major changes in their socio-economic environments (Larson, 1979). The quality of marital relationships can be partially indicated by the frequency of interactions between the partners, and by the amount of negative or positive communication between them.

9.4.1 Role Flexibility

Increasing role flexibility refers to the willingness to share different tasks that a married couple faces: earning the family income, doing the housework, and interacting with relatives. More traditional attitudes assign the role of earning the family income to the male, and assign the role of taking care of the household and contacting kin to the female. The greater the role flexibility within the family, the better able the family is to adapt to problematic situations (Larson, 1979:46). This is perhaps particularly relevant to increased female participation in the labour force.

Respondents were asked to indicate their preferences in response to a statement that the earning of family income should be the responsibility of: the husband only, the husband more than the wife, equally shared by husband and wife, or the wife more, the wife entirely. Of the 727 couples in the Cold Lake region, 32% of our respondents indicated that the husband alone should earn the family's income, and a further 35% thought that it should be the husband more than the wife. Thirty-two percent indicated that earning the income should be shared, and only 11 respondents (1%) indicated that the wife should be responsible more than the husband. In response to direct questioning concerning attitudes towards women working, 24% of the respondents indicated that they disapproved.

When asked about the division of labour for housekeeping, only 2% of the sample indicated that it should be the husband's responsibility. About 13% thought it should be shared equally, 46% thought that the wife should do more, and 41% thought that the wife should do it all. For keeping in touch with relatives 4% of the respondents thought that it should be the husband's responsibility, 45% thought that it should be shared equally, 39% thought that the wife should do most of it, and 11% thought that she should do it all.

An index of traditional attitudes towards the division of labour within a marriage was constructed by adding the degree to which the husband was seen as responsible for earning an income, and the wife was seen as responsible for housekeeping and contacting relatives. Only 1% of the sample scored below the mid-point on the scale, although 5% were right at the middle. Almost one-half of the respondents scored 75 or over (out of 100), indicating a high prevalence of traditional attitudes towards marriage.

When we compared these results with those obtained in Fort McMurray, we found that the Cold Lake general population sample (couples) indicated somewhat more flexibility that the Fort Mcmurray sample. For example, while 32% of the study area sample indicated that the husband alone should earn the income, 43% of the Fort McMurray sample indicated this opinion. One would expect somewhat greater flexibility in the more mobile, younger population of Fort McMurray. Indeed, it appears that the older respondents in the Cold Lake region were more progressive. The correlation between the degree of traditional attitudes towards the division of labour within the household and age of respondent was -.179. While this correlation is not particularly large, it is significant at the .001 level and its sign does indicate that older respondents were less traditional in their attitudes. This impression is reinforced by the correlation of the index with the length of marriage (r = -.108) and the length of residence in the region (r = -.114). Both of these correlations are significant at the .01 level.

If the wife worked there was also considerable indication of greater flexibility (r = -.335), and females also tended to give less "traditional" answers than males (r = -.239). However, traditional attitudes were not significantly correlated with socio-economic status (education, income, or level of living).

9.4.2 Disagreements and Communication

In order to examine interaction between husbands and wives, married and common-law respondents were asked how often they disagreed (communication, negative content), and how often they talked about a series of different topics (communication, positive content). Interviewers asked how often (never, seldom, sometimes, often, very often) respondents disagreed with their spouse about: housekeeping, work schedules, spending money, and visiting or writing relatives. Using the same response categories, respondents were also asked how often they discussed work, and how often they shared personal problems. The distribution of responses to these indicators is presented in Table 9.4, along with responses to these items by a representative sample of Fort McMurray couples.

For the most part, respondents from the Cold Lake region indicated relatively low levels of disagreement. The level of positive communication within the relationship appeared to be fairly high as well. For the items dealing with disagreements, the percentage of respondents indicating a moderate amount of disagreement ("sometimes", "often", or "very often") comprised about 24 or 25% for items dealing with housekeeping, work schedules, and writing or visiting relatives. A relatively high frequency of disagreements about spending money was somewhat more prevalent, with 31% of the married sub-sample indicating that they disagreed at least "sometimes". Respondents generally indicated that they communicated with their spouse relatively frequently. About 31% indicated that they discussed work only "sometimes" or less, and only 21% shared personal problems this infrequently.

Table 9.4 Negative and Positive Communication: Cold Lake Region and Fort McMurray

Indicator	Never	Seldom	Sometimes	Often	Very Often
	Response Categories				
Disagree about:	Percent				
Housekeeping					
Cold Lake[1]	42	34	17	5	2
Ft. McMurray	27	31	28	10	4
Work Schedules					
Cold Lake	50	26	18	4	2
Ft. McMurray	42	28	24	4	2
Spending Money					
Cold Lake	32	36	24	5	2
Ft. McMurray	16	37	29	12	5
Visit/write relatives					
Cold Lake	47	29	19	4	2
Fort McMurray	46	30	17	5	2
How Often:					
Discuss work					
Cold Lake	3	7	21	45	23
Fort McMurray	2	9	19	41	29
Share personal problems					
Cold Lake	1	4	16	44	35
Fort McMurray	1	3	15	37	43

[1] Sample sizes are 727 for couples in the Cold Lake region and 320 couples in the Fort McMurray survey. Sample sizes differ slightly from item to item depending on missing data.

The judgement that there was a relatively low level of disagreement with spouse is reinforced by comparisons with Fort McMurray. There, married couples were somewhat more likely to report that they disagreed about housekeeping at least sometimes (42% versus 24% in the study area sample). Similar results were observed for reported disagreement about work schedules and spending money. Housekeeping, work schedules, and spending money appeared to be particularly contentious issues in Fort McMurray. Only for visiting or writing relatives was there a similar level of disagreement in the study area. This may be a consequence of the relative isolation of the latter, and the relatively low number of cases in which relatives live close by. In such circumstances the topic would probably not come up often.

On the other hand, married respondents in Fort McMurray were no more likely to report relatively low levels of communication (discussing work, sharing personal problems) than were the respondents in the study area. Indeed, if anything, residents of Fort McMurray indicated a little higher communication on these subjects. In the Fort McMurray sample, 29% indicated that they discussed work very often and 43% indicated that they very often shared personal problems. Corresponding figures for the Cold lake region were 23% and 35%, respectively.

Part of the explanation for this may lie in the relationship between age and marital interaction. The older the respondent, the less they communicated ($r = -.220, p <$

.001) and the less they disagreed ($r = -.367, p < .001$). Since the population of Fort McMurray is a good deal younger than the population of the Cold Lake region, this may explain some of the differences in marital disagreement levels in the two areas. In general, the married respondents in study area who had lived in the area longer disagreed less ($r = -.242, p < .001$). Those who had been married longer also reported that they disagreed less often ($r = -.332, p < .001$). These effects are probably a function of age and may reflect a "natural" maturation. As respondents grow older, have been married longer, and have lived in the area longer, their expectations within the marital relationship become better set, and and better understood.

As we would expect, those who reported more stress events within the year prior to the survey tended to report more frequent disagreement with their spouse ($r = .229, p < .001$), and those who had reported that the wife worked also reported somewhat more frequent disagreements ($r = .105, p < .01$). Finally, of all the different measures of socio-economic status, education had the highest correlations with the disagreement index. Those who were better educated reported more disagreement ($r = .179, p < .001$). This may be another reason that Fort McMurray couples reported more frequent disagreement, since, on the average, they had more education than the respondents in the study area.

9.4.3 Interaction With Spouse and Kin

Only 23% of the respondents in the study area indicated that they seldom or never went out just with their spouse. About 44% indicated that they went out often or very often (Table 9.5). The distribution of responses on this item was very similar in the study area and in Fort McMurray, although there was slightly less of this kind of interaction reported between spouses in the latter (40% responded "often" or "very often").

Interaction with spouse was relatively independent of life cycle factors. There was indication of significant differences in spousal interaction by age, length of marriage, sex of respondent, or number of children. While those who had no children were somewhat more likely to report more frequent interaction ($r = .172, p=.001$), even this difference was relatively small in magnitude. As expected, those who reported more frequent interaction also reported more frequent communication ($r = .168, p < .001$) and less frequent disagreements with their spouse ($r = -.123$, $p < .001$). Those who had more traditional attitudes towards the division of labour within the marriage were also more likely to report less interaction with their spouse ($r = -.112, p < .001$). However, none of these relationships were particularly strong.

The presense of kin in the area, as well as interaction with kin, indicates the presence of social support networks that can be activated in the face of problems. About 30% of the married respondents in the area reported that they never interacted with kin within the study area (primarily, of course, because they had no kin in the area). Of those that had kin, most interacted relatively frequently with 58% of the respondents reporting interaction at least several times per month (Table 9.5). Generally speaking, respondents interacted with kin outside the study area more often than they did with kin inside the study area primarily because almost all respondents had kin outside the region. While 61% interacted with kin outside the region several times a month or more, only 11% interacted several times a week or more.

Compared to similar results for Fort McMurray, these responses indicate a relatively high level of interaction with kin. In Fort McMurray, over one-half of the sample reported never interacting with kin within Fort McMurray (including not being visited by them), compared to 30% in the study area. This tends to reinforce the assessment of the study area as relatively rich in kinship support networks, a situation expected in an area with relatively high population stability.

For the whole general sample of the study area (N=940), married respondents and those who were widowed had the highest level of interaction with relatives within the region. Divorced and never married respondents reported the least local kin interaction. Similar (although smaller) differences were observed for interaction with kin outside the Cold Lake area.

For the married respondents in the sample, those who lived in rural areas visited relatives within the study area very frequently (Table 9.6). Both rural farm and rural non-farm married residents averaged over several contacts per week. Urban areas showed lower kin contact within the area, with Grand Centre residents reporting much less contact than residents of Cold Lake or Bonnyville. However, there were not significant differences between areas in contact with residents outside the study area (Table 9.6). All areas within the region reported relatively high contact. While non-local kinship contacts were uniformly high across all social groups within the Cold Lake region, local kin contact was higher for those who had lived in the region longer ($r = .296, P < .001$) and had more children ($r = .157, p < .001$). Interaction was somewhat less frequent for those couples where the wife worked ($r = -.182$, $p < .001$), and for those couples who had higher socioeconomic status (for income $r = -.223, p < .001$, $N=553$). Since the wife most often appears to have the primary responsibility for kin contact, her working appears to cut into the time necessary for such interaction. Those who have higher socio-economic status may be more mobile, and may therefore be less likely to have kin within the area.

9.5 Children

9.5.1 Fertility

It was observed above that while 13% of the couples had no children, only 5% expected to have no children. Altogether, 18% of the couples reported that they planned to have additional children. The sample contained a relatively high proportion of older respondents who had completed their family building.

To simplfy interpretation, the analysis of fertility presented here includes only those couples who had been married once, were still married, and where the wife was less than 46 years of age. These 400 couples had had an average of 2.37 children and planned to have an average of 2.95 (Table 9.7). This compares to figures for Toronto (1968) of 2.3, Ottawa 2.5 (1973) and Canada as a whole 2.3 (1971). However, since there has been a trend towards decreasing fertility throughout the 1970's, such comparisons are a little misleading.

The rural farm sub-sample had the highest average number of children (3.05) followed by the rural non-farm population (2.27) and the three urban communities within the study area (Table 9.7). This rural-urban difference is also reflected in expected parity (number of children). Again, there is little difference between the rural non-farm population and the populations of the urban centres in the study area.

Actual parity levels are higher in the Cold Lake region than in Fort McMurray for all age groups (Table 9.8). This is particularly true for couples where the wife was under 25 years of age. This situation may reflect an earlier age at marriage in the study area. Expected parity is also higher in the Cold Lake region for all age groups, particularly those under 35. Where the wife is over 35, planned completed family size is similar to that in Fort McMurray. Compared to figures for Canada in 1971 actual parity is higher in the study area for those couples where the wife is under 29. It is lower for those between the ages of 30 and 39, and then higher for those between 40 and 45. Overall, actual parity is slightly higher in the study area than it was in Canada in 1971.

The principal difficulty with this comparison is the dated nature of the figures for Canada as a whole, since 1971 was eight years before the baseline survey. Fertility has decreased over the 1970's, and more contemporary estimates, if they were available, would probably yield different comparisons. The effect of this can be seen in the limited comparisons that are available from the 1976 census. From that data we can use only the young. Published figures refer to living children that are resident in the household, and many children would have moved out in cohorts where the parents are older. According to this data, in Canada for married women under the age of 25, parity was .7 and for women between 25 and 34, it was 1.7. For Alberta, the figures were similar: .7 for women 24 and under, 1.9 for

Table 9.8 Parity by Wife's Age

Wifes's Age (yrs.)	Cold Lake Region 1979		Fort McMurray[1] 1979		Canada[2] 1971
	Actual parity	Expected parity	Actual parity	Expected parity	Actual parity
	Averages				
Under 25	1.1	2.6	0.8	2.3	0.9
25-30	1.9	2.7	1.7	2.4	1.7
30-35	2.4	2.9	2.2	2.4	2.6
35-40	3.1	3.1	2.9	2.9	3.2
40-45	3.5	3.5	3.2	3.3	3.3
Total	2.4	3.0	2.0	2.5	2.3
N	378	369	227	227	

[1] AOSERP 1979 (Gartrell et al, 1980).

[2] Collishaw, Neil (1976) 1971 Census of Canada. Profile Studies. "Fertility in Canada". Ottawa:Statistics Canada.

women 25-34. While Fort McMurray exhibited parities for these age groups that were virtually identical to these figures (.8 and 1.9, respectively), the Cold Lake region had parities of 1.1 and 2.2 (Table 9.8). These were considerably higher than the levels for Canada, Alberta, and Fort McMurray. This difference may be all the more striking because the figures for Canada and Alberta are still for a period three years before the Cold Lake survey.

One explanation of these differences may be the relatively old population in the study area. Even though the figures are roughly standardized for age of wife, average age within each category may be higher in the Cold Lake region. Other factors that have been found to affect parity may also be important in explaining these differences. For example, within the study area, Roman Catholic couples reported an actual parity of 2.6 and an expected parity of 3.1. This is substantially greater than the actual parity for the next most prevalent religious group , United and Anglican combined. These respondents averaged 2.3 for parity and 2.8 for expected parity, while all others averaged 2.2 and 2.9, respectively.

Actual parities are also higher for those who reported that their fathers were French (2.7) compared to those from England (2.1), Canadians(2.1) and others(2.5). Those with higher education (for the wife) also had lower fertility. The few wives in the sample that had grade 8 or less averaged 3.7 children. Those with 13 years of education or more averaged 1.9 children. However, since the expected parity for the lowest education category was 3.7 and that for those with post-secondary education was 2.8, a good deal of this difference may simply be the result of age differences. Younger wives have more education, and they also have had fewer children.

There were also significant differences between the number of children for women who worked (2.6) compared to women who did not participate in the labour force (2.2). Again, since women with higher education are more likely to work, the effects of these different factors are difficult to unravel.

Multiple regression results (Table 9.9) predicting actual parity allowed us to take all factors into account at once. Differences between areas within the Cold Lake region could be accounted for by the social composition of the areas. When length of marriage, wife's participation in the labour force, French ethnic status (of father), and wife's years of education were controlled, differences between the areas were not significant. Religious differences (Roman Catholic versus others) and socio-economic status (household possessions) did not have significant independent effects upon actual parity. Controlling for the effects of length of marriage, women who work and those with higher educations had fewer children. Those who reported that their father's ethnic status was French also had more children than did other ethnic groups.

9.5.2 Child Centered Problems

In the general sample as a whole (N=940), 28% expressed approval for a married couple not having children (if they could), and 28% expressed disapproval. With about 43% of the sample chosing a neutral response, it appeared that opinions were not particularly strong one way or the other. When it came to married women who had children working, 77% of the sample expressed disapproval. However, 41% of the married women worked, and 42% of the married women with children worked. Women were just as likely to work if they had children, and the prevalence of women working may indicate economic pressure on families.

Several indicators measured perceived problems with direct relevance to children. The first simply asked whether or not the respondent had experienced any problems getting day care or babysitting. In the section of the interview which dealt with perceived quality of services (discussed above), day care was rated on a 7-point scale (very poor quality to very good quality). The quality of school services was also rated. Finally, one of the items tapping attitudes towards the community asked respondents to agree or disagree (again, on a 7-point scale) with the statement that "there's lots for teenagers to do in this area". These latter three scales were transformed to vary from 0 to 100 with a higher score indicating a higher quality rating.

While the overall frequency of problems with day care and babysitting was moderate, only 4% reported that they had used daycare facilities. About 29% of the married respondents with children reported experiencing problems in this area in the year prior to the interview (Table 9.10). In a similar sample of Fort McMurray residents, 34% reported problems of this kind. While day care services were not rated in Fort McMurray, their ratings in the Cold Lake region were very negative. Over three-quarters of the respondents rated this service as poor (i.e., below 50 out of 100). Only 6% give day care services positive ratings, and 18% gave ratings exactly in the middle of the scale (50 out of 100).

The relatively lowest frequency of problems with day care or babysitting was reported for rural farm families with children. Problems of distance between households appear to be overcome by the presence of older children, and the more tightly knit nature of the community (a topic we shall return to below in discussing neighbourhood and friendship networks). Participation in the labour force did not seem to influence the incidence of reported problems, as problems were more frequently reported where mothers did not work (.30) than where they did (.27). As expected, number of children was negatively related to the incidence of problems. Those with one or two children reported problems in 38% of the cases. One-quarter of the couples with three or four children reported problems, and only 11% of those with five or more children reported problems. The larger number of children probably means that babysitting can be

Table 9.10 Child Centered Problems Perceived by Residents of the Cold Lake Region by Locale

	Indicator[2]			
Locale[1]	Problem with day-care	Evaluation of daycare	Lots for teens to do	Evaluation of schools
	Average			
Cold Lake	.318	11.0	19.9	64.7
Grand Centre	.354	23.5	26.9	66.0
Bonnyville	.322	7.1	27.9	74.8
Rural farm	.147	30.8	33.3	72.5
Rural non-farm	.348	25.2	24.2	73.0
Total	.290	19.3	27.4	70.3
η^2	.031	.150	.024	.029
Sig. level	.050	.001	.050	.050

[1] The sub-sample used in this analysis included all married or common-law respondents who had children living at home. N varies somewhat for different items, since differing numbers of respondents found questions to be not applicable to them (for example, if children were too old for daycare or babysitting).

[2] "problem with daycare" is a binary item (read as a proportion, evaluations are out of 100 points, as is "lots for teens to do" (disagree to agree).

handled by older siblings in many instances. Generally, the incidence in the three urban areas was very similar to that reported in Fort McMurray (.34), ranging from .32 in Cold Lake, to .35 in Grand Centre (Table 9.10).

While the incidence of problems was moderate, quality ratings of day care services were low in all areas within the Cold Lake region. The overall average rating was only 19 out of 100, with the rural farm area giving these services the best ratings (33), and Cold Lake and Bonnyville residents giving extremely low ratings (11 and 7, respectively). While there were no more problems reported in these areas than in Grand Centre (indeed, there were fewer), the quality of day care was evaluated as poorer. Area differences accounted for 15% of the variation in ratings, but few other factors were correlated with the problem. Long term residents were just as likely to give low ratings as were short term residents, and households where the wife worked gave similarly negative ratings to those where the wife did not work. Having more children was not correlated with the quality ratings, and neither was frequency of visiting relatives within the area (an indicator of social support available). Low ratings may have been a product of the visibility given to the issue, particularly in Bonnyville. Low ratings may also be a consequence of lack of services. Only 4% of the relevant sub-sample used such services.[18]

People also felt that there were problems with the provision of activities for teenagers. Almost three-quarters of the married respondents with children disagreed with the statement that there was lots for teenagers to do in the area, and only 16% agreed. These ratings did not vary as greatly across communities within the study area (Table 9.10). Again, the rural farm community perceived the fewest problems, and residents of Cold Lake perceived the most. Interestingly enough, this problem appeared to be more severe in the study area than it was in Fort McMurray. There, 46% of a similar sample indicated that they thought that there was not lots for teenagers to do, while 31% thought that there was. Industrial development and population increase may possibly provide a situation where more job and recreational opportunities can be created within the area.

The evaluation of schools was relatively positive compared to the evaluation of day care and problems with activities for teenagers. However, even here evaluations were lower (70.3) than those given by residents of Fort McMurray(75.7). Again, evaluations were lowest in Cold Lake, but schools were rated highest in Bonnyville. Differences between communities were relatively small, accounting for only 2.9% of the total variation in evaluations.

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[18] The sub-sample needing such services is difficult to estimate, since the availability of alternative sources and the need for after-school childcare may complicate the issue. Here we simply refer to couples with children at home.

9.6 The Quality of Family Life

More generally, respondents' perceptions of the quality of their own family life, and their attitudes towards the community provide pre-impact indicators describing life in the study area. Despite the problems noted above, respondents rated their family life as very satisfying. They also perceived their communities to be positive environments in which to raise a family.

In the Cold Lake region, 42% of the respondents agreed that family breakdown was common. At first glance this appears to be high. However, 72% of a sample of adults in Fort McMurray thought that family breakdown was common there, a difference that is significant at the .001 level. Only 34% of the respondents to the survey of the Cold Lake region agreed that marital infidelity was common. This was significantly lower than that 55% of the Fort McMurray sample who had the same opinion. Fewer people appear to perceive marital problems in the Cold Lake region.

For the married sub-sample in the study area, the average score was 79 out of 100 on their rating of their community as a place to establish a permanent home. (Table 9.11) For a similar sub-sample from Fort McMurray, the average score on this indicator was 60. The residents of Cold Lake see fewer marital problems and judge their area as a better environment for their families.

Table 9.11 The Quality of Family Life by Locale

Locale	Family satisfaction	Good place to raise a family	Place to settle permanently
	Average		
Cold Lake N=120	87.2	75.1	74.9
Grand Centre N=157	87.9	65.2	70.9
Bonnyville N=196	86.4	78.1	80.8
Rural farm N=166	90.8	87.7	88.4
Rural non-farm N=87	87.3	82.7	80.5
Total N=727	88.0	77.6	79.4

While the reputations of Fort McMurray and the study area were very different among their respective residents, reported satisfaction with their own family life was not. Family satisfaction received a high rating of 88 out of a possible 100 from the married residents in the study area. Fort McMurray residents averaged almost as high (87.5), as did respondents to the 1979 Edmonton Area Study (85.7). The negative reputation of Fort McMurray did not seem to affect its residents' satisfaction with family life (Gartrell et al., 1980). Apparently, the community environment had relatively little impact on reported family satisfaction.[19]

In the total sample of the Cold Lake region, married respondents were generally more positively oriented towards the area (Table 9.12) The small proportion of the sample (11%) who were living common-law, or were separated or divorced generally viewed the situation in the study area less favourably on these attitude questions. All communities within the study area reported very high family satisfaction (Table 9.11) For the two other indicators which dealt with the communities themselves, general opinions were also positive. Relatively speaking, those in the rural farm area rated their communities as the best places to raise a family or to establish a permanent home. Residents of Grand Centre rated that area the poorest. However, compared to the ratings given by residents of Fort McMurray (an average of 60 out of 100), they still rated their community fairly positively (71 out of 100).

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[19] In making these comparisons it should be pointed out that Fort McMurray was sampled after construction of Syncrude was completed. This may have left the community with a reputation for problems, and yet have seen the families that had them leave in disproportionate numbers. The advantage of a pre-impact survey is it can directly address such issues when results are compared to later panel data.

Family satisfaction did not vary significantly across the different communities within the region. Also, the only individual trait with which it was correlated was the index of stress events ($r = -.142$, $p < .001$). Length of marriage, number of children, the wife's participation in the labour force, socioeconomic status, and a number of other factors did not covary significantly with family satisfaction. This indicator proved to be relatively insensitive to individual differences in social or economic status. The other two indictions reported in Table 9.11 were somewhat more sensitive to individual differences. The older the respondent, and the longer he or she had lived in the area, the more they agreed that this was a good place to establish a permanent home ($r = .232$ and $r = .240$, respectively). Similar positive correlations were also observed for attitudes towards the area as a place to raise a family.

Length of marriage and the number of children were also positively correlated to both indicators of the quality of the area for family life. The longer they had been married, and the more kids that they had, the better they liked the area. Life stress events were significantly negatively ($p <$ .001) related to both indicators, as was education. While indicators of economic status (income, household possessions, home ownership) were unrelated to the perceived quality of family life in the area, people with higher education were somewhat more negative about the community as a place to raise a family ($r = -.130$, $p < .001$) and were less positive about the area as a place to establish a permanent home ($r = -.219$, $p < .001$).

9.7 Summary

The Cold Lake region had the high proportion of married respondents that is fairly typical of small town and rural areas in Canada. Family sizes were generally large, and larger in the rural than in the urban areas within the study area. Over 80% of the married respondents lived in single family housing. Married respondents tended to have lived in the area a long time (an average of 21 years), and they reported relatively few stress events compared to those who were not married.

Married respondents were not particularly inclined to share traditionally sex-typed roles (men earning the money, women doing the housework), but were more flexible than the relatively younger and more mobile population of Fort McMurray. Generally, women, those with more children, and particularly respondents in a family where the wife worked tended to be more non-traditional with regard to the division of labour within the family. While older respondents were also more flexible in their attitudes towards the division of labour within the family, they were less likely to agree that married women should work. Only about one-half of the respondents approved of married women working.

Couples in the study area reported less marital disagreement than did those in Fort McMurray (particularly over spending money and housekeeping). There was a high rate of communication with spouses reported in the study area, and about 44% of the married respondents reported that they got out with their wives often or very often. Almost 60% reported fairly frequent interaction (several times a month or more) with kin within the area, but 30% reported no kin contact. This indicated relatively dense local kin networks compared to Fort Mcmurray, where 57% had no local contacts with kin.

Only 5% of the couples in the sample of the general population of the Cold Lake region expected to have no children, although 13% had not at the time of the interview. Indeed, 80% of the married couples indicated that their families were complete. Among once married couples where the wife was 45 years of age or younger, fertility was high in all age cohorts. This was particularly the case for women under 35. Grand Centre had the lowest fertility rate and the rural area had the highest. These differences were accounted for by the social composition of the areas (different age compositions, different proportions of wives in the labour force).

About 41% of wives worked, and 42% of married women with children worked. Despite this, 77% of the sample disapproved of married women with children working. Respondents reported day care services and activities for teenagers as problems , although the quality of school services was rated relatively highly. Over three-quarters of the parents rated day care services negatively, with extremely low ratings given in Bonnyville and in Cold Lake. While low service use may indicate a lack of facilities, no more problems in finding adequate babysitting or day care were reported in those communities than in any others. Activities for teens were rated a problem by 73% of the sample (compared to 45% in Fort McMurray). Again, particularly negative opinions were given by residents of Cold Lake, although residents in all areas seemed to feel that there were too few activities.

Despite these problems, respondents were very positive in their ratings of the area as a place to settle permanently and raise a family. Those living in rural areas were particularly positive, while urban residents were somewhat less so. Residents were uniformly very satisfied with their family life.

10. ASSOCIATIONS, NEIGHBOURS AND FRIENDS

10.1 Social Participation and Social Networks

Sociologists have long argued that the development of modern society has weakened primary social ties ... the ties between kin, neighbours, and friends. Such primary ties are relatively diffuse. Each is relatively open-ended in its expectations, and often is heavily laden with emotional content. The development of large-scale bureacracratic forms of organization, the increasing complexity of the division of labour, and urbanization and industrialization themselves have purportedly created a society in which individuals are increasingly dependent on formal organizations and secondary social ties (Stein,1960; Nisbet, 1962). "Urbanism as a way of life" (Wirth,1932) has led to a loss of the sense of community, and this in turn has created social disorganization.

This is what Wellman and Leighton (1979) have labelled the "community lost" hypothesis. A number of authors have assumed that this problem is exacerbated by the rapid growth associated with the development of boom-towns (Summers et al., 1976; Himelfarb, 1976; Lucas, 1971; Larson, 1979). With reference to Fort McMurray, Van Dyke and Loberg observe that social rather than geographic isolation seemed to be a more acute problem (1978:97). The geographic mobility necessarily associated with rapid population growth, and the turnover that usually accompanies such rapid change, reputedly create social impermanence, social disorganization, and apathy (Summers et al., 1976). Newcomers do not always plan to stay, and hence they may not "put down roots" by participating in community voluntary associations, or making the effort to get to know their neighbours. Even when they do, a much higher proportion of the population is new at any one time, and there is usually some lag associated with forming such ties.

Without the social support that informal and formal participation brings, socially isolated individuals cannot maintain satisfactory life-styles. As a result, social agencies may be called upon to deal with an increased problem load. In other words, the rapid population growth associated with large scale resource development would be predicted to dramatically "speed up" a deterioration of social network ties that has reputedly been going on in the society as a whole.

The empirical status of these hypotheses has been challenged on several grounds. First, no matter how rapid the population turnover, people within a given locality must interact to some degree, if only to meet problems arising out of their common life in the area (Wilkenson, 1978). The picture of a loss of community may thus have been overdrawn. Secondly, a number of authors have pointed out that friendships and other primary ties (particularly kinship) are not necessarily spacially bound. Even if people associate less with their neighbours, they may still maintain other kinds of primary ties, and they may maintain them despite geographic separation(Wellman and Leighton; Hunter, 1978; Fischer, 1976). Besides, urbanites still do form and maintain neighbourhood ties (Warren, 1978; Gans,1967; Liebow; 1967). Thirdly, the many secondary associations that urban life brings may indeed create a large number of "weak ties". Such a situation may bring a certain degree of individual freedom that comes from higher choice (Wellman, 1979). It may also bring indirect access to a much greater diversity of resources than would stronger but less wide ranging primary ties (Granovetter, 1973). This "freedom gained" (Wellman and Leighton, 1978) may be a matter of leaving interfering relatives, or it may provide the opportunity to become financially independent (Van Dyke and Loberg, 1978).

Presumably then, we might expect to find that the general population of the Cold Lake region would exhibit relatively strong primary ties. We have already observed such results when we examined the frequency of interaction with kin within the study area. As was the case for local kinship ties, other primary ties would also be predicted to be stronger in the rural areas within the Cold Lake region. Residents of the rural farm community and smaller hamlets could hardly be expected to have lost their "sense of community" to urbanization. In addition to these rural-urban differences within the study area, we might also expect that the relatively high level of integration into local neighbourhood and friendship networks might take a relatively long time to form. In this sense, ties would be relatively strong compared to places like Fort McMurray that have recently experienced very rapid population growth, and they would be strong compared to larger urban cities such as Edmonton. But they would also take longer to form, and would therefore be more susceptible to rapid population growth and increased turnover.

10.2 Membership and Participation in voluntary Associations

10.2.1 The Level of Association Affliation and Participation

Given the rural and small town nature of the settlements in the study area, associational affliation appears to be relatively high(Table 10.1). A majority of residents claimed at least one associational affiliation, and 30% claimed two or more. This represents a level of affilation similar to Fort McMurray, although the study area had relatively more multiple associations than did Fort McMurray in 1969, and slightly less than it had in 1979. While levels of affiliation were slightly lower than those for Canada as a whole, they were entirely typical of small town residents in North America (Curtis, 1971; Hyman and Wright, 1971). Indeed, since levels of affilation in Canada have been relatively high compared to other industrialized nations (Curtis, 1971), this only reinforces the picture of "normal" development in secondary, formal organizational

Table 10.1 Associational Affiliation and Participation: Cold Lake Region and Fort McMurray Results

Place	No.of Org. Memb.	No. of Meetings /4 wks.	Church attend. /4 wks.	Hrs. vol. work / 4 wks.
Fort McMurray				
Average	1.10	1.04	0.86	4.43
St. dev.[1]	1.36	2.58	2.15	15.08
N	429	415	425	427
Cold Lake Region				
Average	1.18	1.09	1.85	5.29
St. dev.	1.47	2.63	3.98	18.36
N	940	938	939	936
t	0.92	0.29	5.91	0.92

[1] Standard deviation, S_x, is a measure of variation (spread) in the distribution of scores..

ties.

The average level of membership in voluntary associations was 1.18 for the general population of the Cold Lake region(Table 10.1). This did not differ significantly from the average of 1.10 for Fort McMurray ($t = .92$, $p > .05$). If Fort McMurray is considered as more urbanized than the study area, there is not the size of place difference that was predicted to influence the development of secondary assocational ties. The absolute level of organizational affiliation in the study area appeared to be relatively low, but the relative level was fairly high.

The rate of participation in formal organizations was measured by three indicators which asked respondents to report the frequency of participation in the four weeks prior to the interview. This information was collected for the number of organization meetings attended, church attendance, and hours of work in voluntary associations. As has been briefly noted in the discussion of non-work (leisure) activities, the average rate of meeting attendance was higher in the Cold Lake region than it was in Fort McMurray(Table 10.1). In the study area sample, 37% reported that they had attended one or more meetings in the four weeks prior to the survey. In the Fort McMurray sample 27% reported at least one meeting attended. However, this difference was also not significant at the .05 level. A similar situation presented itself for hours of voluntary work. About 31% of the sample from the Cold Lake region had done some voluntary work, compared to 25% of the Fort McMurray sample. Again, the difference was not significant at the .05 level. The one indicator for which a significant difference did appear was church attendance. Respondents in the Cold Lake sample averaged 1.85, while residents of Fort McMurray averaged .86 ($t = 5.9$, $p < .001$).

Community differences in association memberships and participation generally fail to show the predicted rural urban differences(Table 10.1). If anything, residents of rural areas participated more in secondary associations than did residents of the three towns within the study area. There were significant differences between areas in organization memberships, with Bonnyville and the rural non-farm populations exhibiting particularly low levels. This may be the result of the age structure of the population (if older people have fewer organizational affiliations), but such an explanation would seem to be obviated by the high level of organizational affiliation in the rural farm sub-sample (1.41). The different communities within the study area did not differ significantly in number of meetings attended, or in hours of voluntary work (Table 10.2). There were, however, significant differences in respondents reports of church attendance. Bonnyville had by far the highest level of attendance (3.07), followed by the rural farm sub-sample (2.16). The lowest levels of attendance were among the rural non-farm population (averaging .91) and the sub-sample from Grand Centre (.87).

In summary, the picture of rural areas as oriented towards non-secondary networks is not confirmed by this data. Rates of assocation membership were approximately normal for the study area as a whole, and the rural farm population had the highest level of associational affiliation. There were generally few significant differences between the study area and Fort McMurray in terms of meeting attendance or voluntary work. Neither were there significant differences between the various sub-samples within the study area in these two indicators of the rate of participation in secondary, formal associations. There were ,however, marked differences in church attendance between Fort McMurray and the study area, and within the study area itself. Otherwise, the population of the study area appeared to join organizations, attend meetings, and give of their time for voluntary work at levels similar to those in Fort Mcmurray. These latter levels were judged to indicated little or no negative impact of rapid development (Gartrell et al., 1980).

10.2.2 The Development of Secondary Ties

The comparison of age and migration cohorts is again used to make inferences about changes over time. The examination of age cohort differences is particularly relevant to individual change through maturation in the life cycle. Migration cohort differences allow inferences about changes that may occur as individuals live in the region longer.

Associational affiliation generally increases with age until a point in the late 40's, and then decreases (Curtis, 1971;Hyman and Wright,1971). In Fort McMurray, age was generally positively related to participation (Gartrell et al., 1980). This was particularly true for voluntary work, where those over 45 years of age had very high participation rates (averaging almost 13 hrs.). However, in that sample there were so few respondents over the age of 45 (10%), that it was difficult to make reliable observations concerning that part of the age distribution.

In the Cold Lake region, we observed the expected inverted "U"shaped curve for both the number of associational affiliations, and the number of meetings attended in the four weeks prior to the interview (Table 10.3). For both of these indicators, there was an increase through the 35-44 year old cohort, followed by a decrease. While linear effects were not significant, non-linear effects were significant at the .001 level for associational affiliations, and at the .005 level for number of meetings.

For the remaining two indicators, church attendance and voluntary work, linear effects were significant (at the .001 and .05 levels, respectively). As age increased, both attendance at church and hours of voluntary work increased. Effects were much stronger in the case of church attendance, where 5.8% of the variance was accounted for by age differences. The apparent drop for the 55-64 cohort for church attendance, and for the 65 and over cohort for voluntary work, did not constitute significant deviations from linearity.

Comparisons of migration cohorts revealed far less systematic patterns, and length of residence differences generally accounted for less of the variation in participation than did age (Table 10.4). It is particularly interesting to examine differences across the most recent migration cohorts to see how long it takes migrants to develop organizational ties. The average number of organizational affiliations reported by the cohort who moved to the Cold Lake region between the Fall of 1977 and the Fall of 1978 (1-2 years residence) was higher than that for the most recent cohort who had moved into the region within the year prior to the survey. In this sense, there appears to be a relatively rapid integration of new residents into secondary networks.[20]

The average number of meetings attended also increased markedly over the first three migration cohorts (Table 10.4). Church attendance increased little over the most recent migration cohorts, indicating that these ties were relatively "portable". In such a situation, church groups may form an important mechanism through which new migrants may be integrated into the community.

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[20] Of course, some organizational affiliations are portable in that they refer to national associations. Where local affiliates exist, this probably facilitates integration into the local community.

For voluntary work, there was little difference between cohorts below 3 years' residence. However, those who had lived in the region longer than three years reported considerably higher levels of volunteering. This may in part reflect high participation rates of older respondents, particularly in religious associations.

10.2.3 Selectivity in Formal Participation

Males generally report higher levels of associational affiliation and participation than females, and the married report higher participation than the single(Hyman and Wright, 1971). Those with higher socio-economic status also generally report higher formal participation.

In the present sample, males reported significantly more organizational affiliations than did females (Table 10.5). Males reported more meetings and hours of volunatary work than females, while the reverse was true of church attendance. None of these latter differences were significant at the .01 level. Married respondents (including common-law) had significantly higher levels of associational affiliation and participation in meetings than single respondents (Table 10.5). Differences for voluntary work were in the same direction, but were not significant at the .01 level. Again, the direction of effects was reversed for church attendance, and again, differences were not significant. Results for both sex and marital status differences were the same as those found for Fort McMurray

(Gartrell et al., 1980). Only church attendance reflected significant differences by ethnic status of father or religious preference. Roman Catholics and those with French ethnic status attended church more often (p < .001).

The employed belonged to more voluntary associations and went to more meetings than the those who were not in the labour force, although they also went to church significantly less often (Table 10.5). Those who worked for the Department of National Defence (DND) also belonged to significantly more organizations and went to church less often.

Higher socio-economic status was generally associated with higher levels of organizational affiliation, particularly for education, household possessions, and home ownership. Similar effects were observed for the number of meetings attended, but again, no significant effects were observed for volunteer work. Respondents with higher education or higher income tended to report lower church attendance.

Generally speaking, only age differences in organizational affiliation and participation were large. These changes represent maturational differences over the life cycle of individuals, and appear to be similar to those observed in other populations. As predicted, those with higher socio-economic status participated more in formal organizations, but reported lower church attendance than did respondents with relatively low levels of education and income. Church attendance was also strongly associated with ethnic and religious status. These appeared to be few socio-economic barriers to participation within the study area, and levels of participation appeared to be fairly high.

10.3 Neighbours

Neighbourhood or "community" ties are reputedly stronger in rural areas than they are in small towns, which in turn exhibit stronger neighbourhood networks than do larger cities. It is these ties whose loss is lamented by some (Stein, 1960), and "praised" by others (Wellman, 1979). In this pre-impact assessment we cannot directly address whether such ties are likely to be lost to rapid change. We can, however, address a number of issues:

1. How strong are these ties, particularly when they are compared to places that are larger (Edmonton) or have experienced rapid growth (Fort McMurray)?
2. How quickly do these ties develop over the life cycle of individuals, and how long do they take to develop after people move to the area?
3. Do the rural areas within the region exhibit stronger ties, and how quickly do those ties develop within rural and urban regions within the study area?
4. What other factors appear to facilitate or inhibit the development of neighbourhood ties?

This discussion uses two indirect measures of the strength of neighbourhood networks. The first relies on respondent reports of the percentage of their neighbours that they know by name. The second refers to how frequently they interact casually with their neighbours. In previous research the measure of neighbours known proved to be more sensitive to variation within populations (Gartrell et al., 1980).

10.3.1 The Strength of Neighbourhood Networks

The Cold Lake region exhibited relatively strong neighbourhood networks in the sense that a relatively large proportion of the sample reported knowing a high proportion of their neighbours (Table 10.6). The proportion of neighbours known was significantly higher in the Cold Lake region than it was in either Edmonton or Fort McMurray.[21] The magnitude of this difference is dramatically expressed by the 43% of the residents of the study area who reported that they knew all or almost all of their neighbours. Comparable figures for Fort McMurray and Edmonton were 7% and 6% respectively. At the other end of the scale, only 15% of the residents of the Cold Lake region reported that they knew none or almost none of their neighbours. Comparable figures for Fort McMurray were 42%, and for Edmonton they were 45%.

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[21] Fort McMurray also exhibited a higher proportion of neighbours known than did Edmonton, despite the high growth rates and high population turnover in the former. The effects of size appear to be more important, despite the efforts of community league organizations which attempt to integrate neighbourhoods in Edmonton

Table 10.6 The Proportion of Neighbours Known: Cold Lake Region, Fort McMurray and Edmonton (1979)

Proportion of neighbours known	Cold Lake Region	Fort McMurray	Edmonton
	Percent		
None	3	13	12
Almost none	12	29	33
Less than half	17	32	30
About half	16	12	13
Over half	9	5	7
Almost all	24	7	4
All	19	0	2
Total	100	100	100
N	940	430	440
Average[1]	3.62	1.99	1.87
St. Dev.	1.83	1.46	1.34

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[1] The mean and standard deviation were calculated by assigning integer scores to the sever categories (ranging from 0 to 6).

Similar results were obtained for reported interaction with neighbours, although differences between the study area and other places were somewhat smaller(Table 10.7). In the Cold Lake region 50% of the sample reported that they got together casually with their neighbours at least once a week. In Fort McMurray 32% reported interacting this frequently, and in Edmonton, 29% reported similar levels. In the Cold Lake region only 10% of the sample reported never chatting with neighbours. Figures for Fort McMurray and Edmonton were over twice as high (21% and 22% respectively).

10.3.2 The Development of Neighbourhood Ties

As predicted, the longer people had lived in the area, the higher a proportion of their neighbours they knew by name(Figure 10.2). Length of residence in the area explained a rather large 24.3% of the variation in knowledge of neighbours.[22] Even those who had lived in the community for less than one year averaged scores (1.85) that were similar to the overall average for Edmonton (1.87).[23] Knowing neighbours increased rapidly over migration cohorts within the study area. From this we would infer that not only are

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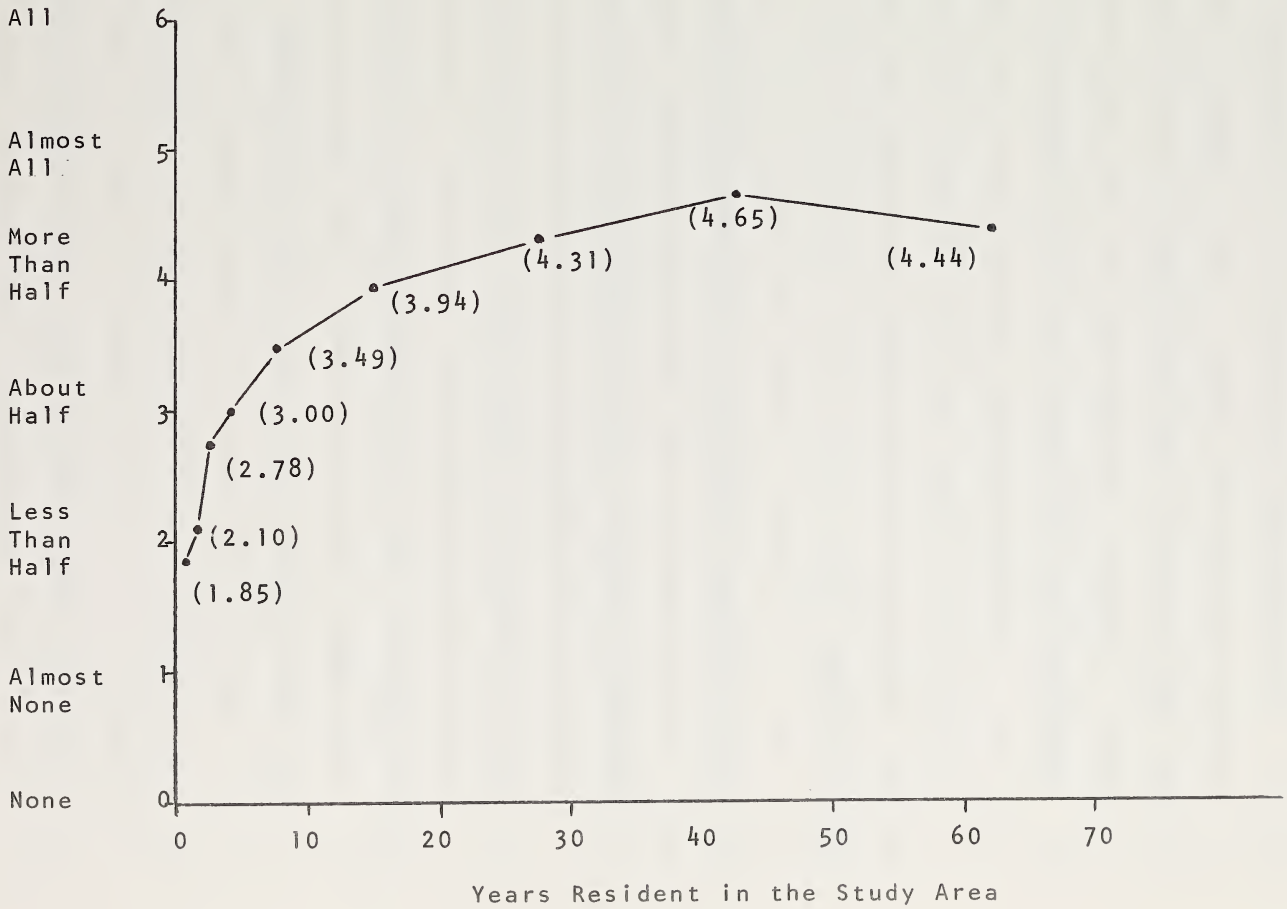
[22] What appears to be a curve in Figure 10.2 is actually not significantly different from a straight line. The test for any non-linear component in the relationship was not significant at the .05 level.

[23] Only 4.3% of the Edmonton residents interviewed in the 1979 EAS had lived in the city less than one year, and 63% had lived there for 10 years or more. The difference in neighbourhood ties between Edmonton and Cold Lake were probably not simply a function of length of residence per se. In addition, differences between Edmonton and Fort McMurray suggest no negative impact of rapid development in the latter.

Figure 10.2 Knowing Neighbours: Migration Cohort Comparisons



neighbourhood networks strong, but newcomers are integrated into them relatively quickly.

Much the same relationship is observed for differences between age cohorts (Figure 10.3). However, the differences by age are smaller (the slope of the line is less steep), and a smaller proportion of the varition in knowing neighbours is accounted for by differences in age (r^2= .108). In many respects, integration into neighbourhoods is a function of normal life cycle changes involved in length of residence in the area, and age of the individual involved.

10.3.3 Locale Differences in Neighbourhood Networks

As predicted, the rural areas within the study area exhibit stronger neighbourhood networks than the urban areas (Table 10.8). Differences between areas account for 24.4% of the variation in the index of proportion of neighbours known, but only .5% of the variation in interaction with neighbours. The rural farm population reported the highest knowledge of neighbours (5.2), slightly above "almost all" on the original scale. Rural non-farm residents (principally villagers) also knew a high proportion of their neighbours (averaging 4.4). Residents of the three urban areas of Bonnyville (3.7), Cold Lake (3.2), and Grand Centre (2.7) reported lower proportions of neighbours known. However, these proportions were still well above those reported for Fort McMurray (2.0) or Edmonton (1.9).

Differences in frequency of casual interaction with neighbours are probably influenced by the ecological setting of these different areas. Rural farm neighbourhoods, because they are spread out over a relatively large area, may offer less opportunity for casual interaction than more densely populated town or village settings. Indeed, differences between sub-areas within the region were not significant ($p > .05$), and interaction appears to be uniformly relatively high.

The development of neighbourhood ties within locales show some differences, but rural areas show stronger networks for all migration cohorts (Table 10.9). The rural non-farm area has relatively more people who have moved into the region recently (within the past three years). These people exhibit a relatively low average proportion of neighbours known. This increases dramatically for those in the second broad cohort (3-10 years residence). For both the rural farm and rural non-farm sub-samples, increases in proportion of neighbours known are relatively small beyond this second broad cohort. The three urban areas all have lower levels, and all exhibit similar increases from the first to the second cohort. Levels continue to increase after 10 years residence for those in Cold Lake and Bonnyville, but there is little increase in Grand Centre. This may reflect higher turnover associated with the higher proportion of new residents in that area . Almost one-third of those sampled in Grand Centre had moved to the region within the last 3 years, compared to less than one-quarter in either of the other two urban areas.

Comparisons of the strength of neighbourhood networks across places indicate that the larger (more urbanized) the place, the lower the proportion of neighbours known.[24] Growth rates have been higher in Fort McMurray and in some of the urban areas within the Cold Lake region than they have in Edmonton itself. This fact alone suggests that size rather than rate of growth is the more probable explanation for the relative strength of neighbourhood networks. This explanation is supported by the observation that people get to know their neighbours relatively quickly. Analysis of differences in the development of neighbourhood ties within the study area also suggests that those areas that have a high proportion of new residents exhibit both lower strength of networks, and different patterns of development.

10.3.4 Correlates of the Strength of Neighbourhood Ties

The strong association of age and length of residence with the proportion of neighbours known has already been noted. These factors may in part account for the observed differences between communties within the study area. That is, different levels of neighbourhood network strength may be a product of the socio-demographic composition of the community.

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[24] In this sense, Fort McMurray is more like a large urban city (Edmonton) than it is like the smaller towns within the study area.

There were also a number of other significant demographic differences in knowing neighbours. While male and female respondents did not differ, married (and widowed) respondents reported significantly higher proportions of neighbours known. Marital status differences accounted for 7.4% of the variance in knowing neighbours. Number of children in the household positively affected knowledge of neighbours, but effects were relatively small ($p < .01$). Ethnic status and religion did not appear to act as barriers or facilitators to integration into neighbourhood networks, since neither were significantly associated with knowing neighbours ($p > .05$).

The employed knew fewer of their neighbours on the average, probably because they have less time to get to know them. Socio-economic status showed mixed results. Education was negatively correlated with knowing neighbours ($r = -.136, p < .001$), as was household income ($r = -.157, p < .001$). These relatively small effects may reflect the higher mobility and/or younger age of the highly educated or those with high incomes. On the other hand, housing factors were moderately correlated with knowing neighbours. Those in single family housing knew a higher proportion of their neighbours ($r = .286, p < .001$) and those who owned their homes knew a higher proportion as well ($r = .345$, $p < .001$). These factors are positively associated with stability.

There was clearly a good deal of overlap between the relationships which the various socio-economic and demographic indicators had with the strength of neighbourhood networks. In a preliminary attempt to identify the magnitude of independent effects on the strength of neighbourhood networks, a stepwise multiple regression analysis was performed. The reduced form equation reported in Table 10.10 showed that eight variables explained about 38% of the variation in the index of proportion of neighbours known. [25] Length of residence in the area had strong significant effects on the strength of neighbourhood networks even when a number of other factors were controlled (Table 10.10). The longer people had lived in the community, the higher the proportion of their neighbours that they reported knowing. Also, the more children that they had, the higher the proportion of their neighbours that they knew . Residents may get to know their neighbours through their children.[26]

Those who owned their own homes and those who lived in single family dwellings knew a higher proportion of their neighbours. [27] The more household possessions owned, the greater the proportion of neighbours known. Neither of the negative effects of education or household income were significant when these other positive effects of socio-economic status (home ownership, single house, household possessions) were controlled. Socio-economic status had positive effects on the strength of neighbourhood networks.

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[25] The first four variables entered into the equation explained most (81%) of the variation accounted for in Table 10.10.

[26] These effects are independent of the effects of length of residence in the community, and by inference, age of respondents as well. Age and length of residence were highly correlated (r = .61) and age was also strongly associated with number of children.

[27] For repondents who lived in single family homes which they owned, the predicted value of the neighbours known index would be .867 greater than the predicted value for those who lived in other kinds of dwellings and did not own them.

Differences between the strength of neighbourhood networks in Bonnyville and Cold Lake were accounted for by the demographic and socio-economic differences between those communities. However, even when all relevant socio-economic and demographic factors were controlled, rural farm and rural non-farm residents still reported that they knew a higher proportion of residents than did residents of other locales. Residents of Grand Centre reported weaker neighbourhood networks than other areas. These differences could not be accounted for by length of residence in the community, our only indicator of turnover. They appeared as "residual" differences unexplained by the kinds of factors included in the regression analysis.[28]

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[28] Rural farm residents scored 1.44 higher than residents of other areas, and those living in rural non-farm areas scored 1.07 greater. The difference between rural farm and rural non-farm was also significant ($p < .01$). The strength of neighbourhood networks was also significantly lower in Grand Centre than it was in either of these areas($p < .001$). It averaged 1.41 as opposed to 3.16 for the rural farm sample, and 2.80 for the rural non-farm population. These figures represent conditional means controlling for other factors in the equation (Table 10.10).

10.4 Friends

The 1979 survey of Fort McMurray found significantly higher interaction with friends (visiting at home) than was reported in a contemporary survey of Edmonton. This may have been a consequence of the differences in age composition between the two samples. Young people generally interact with friends more often, and Fort McMurray's population was relatively young(Gartrell et al., 1980).

These results are reported in Table 10.11 where they are compared with results for the Cold Lake region. Again, the study area exhibited high levels of network interaction, and these levels were higher than those reported in Edmonton ($p < .001$). While the level of interaction in Fort McMurry was slightly higher than that reported in the study area, this difference was not significant ($t = 1.54, p > .05$). These results may have been in part a product of the different age composition of Fort McMurray and the study area.

10.4.1 The Development of Friendship Networks

Given the unreliable nature of retrospective data referring to past interaction levels and the lack of measures at two different points in time, attempts to infer change must rely on cohort comparisons. Length of stay in the community had strong effects on knowing neighbours, but it did not have significant effects ($p > .05$) on interaction with friends. Analysis of variance results showed that interaction with friends increased from 4.25 for the most recent cohort (those who migrated to the area within the past year), to 4.47 for those who came between 1 and 2 years before the survey. The level of interaction increased again for the third cohort (2-3 years residence) to 4.50. However, these differences were small, and the level of interaction fluctuated in a narrow range over remaining cohorts (from 3.98 for the 5-10 yrs. resident cohort, to 4.33 for the oldest cohort of 50-76 years resident). This pattern of results would seem to indicate that people appeared to become integrated into local friendship networks very quickly on their arrival in the area. Indeed, they may have had friends (or relatives) in the area before moving.

While there was no systematic pattern of variation in interaction with friends over the migration cohorts, differences between age cohorts were marked(Figure 10.3). The overall trend was negative and significant ($r = -.149, p < .001$) as were deviations from linearity ($eta^2 = .063$. $p < .001$). The youngest cohort (18-25 year olds) reported the highest level of interaction (5.08). This dropped sharply for the following two cohorts (25-35 and 35-45). Part of the reason for this life cycle change probably involves the difference between the never-married (averaging 4.35) and the married (averaging 4.02). As respondents grow older, become married and are therefore more involved with their own families, their interaction with friends decreases. This line of reasoning is also supported by the negative correlation between number of children and interaction with friends (r = -.154,p < .001).

Interaction with friends increased slightly from middle age onwards, particularly for the oldest cohort (65 and over). During this period of the life cycle, maturational changes may see decreasing involvement in family life, decreasing demands of occupational pursuits, and a corresponding emphasis on friends.[29]

10.4.2 Correlates of Interaction with Friends

Respondents were also asked for their opinions concerning a number of other attitude statements dealing with friendships. Only slightly over one-quarter of the sample (28%) agreed that people moved so often that it was difficult to keep friends. Similarly, 80% of the sample reported that it was easy to make friends, although over one-half (56%)indicated that one of the problems with the world today was a lack of lasting friendships. We might infer that they did not feel that this general condition affected them personally. In Fort McMurray 13% of the respondents felt that it was not easy to make friends compared to only 8% in Cold Lake. And with the higher turnover, a majority (56%) of Fort McMurray residents felt that it was hard to keep friends because of the high mobility. Only 28% of the residents of the Cold Lake region shared this opinion.

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[29] Results from the 1979 AOSERP survey of Fort McMurray indicated a negative association between age and interaction with friends (r = -.260). Non-linear effects were not significant, perhaps because those over 44 faced a relative scarcity of peers.

People who reported more associational affiliations also tended to report that they interacted with their friends more often ($r = .141, p < .001$). There was a similar tendency for more frequent church goers to visit friends more often ($r = .144, p < .001$). However, neither meeting attendance nor voluntary work was significantly associated ($p > .01$) with the level of interaction in friendship networks. Participation in secondary networks had only slight effects on the strength of friendship networks. There appeared to be few status barriers to interaction with friends. There were generally only weak correlations between socio-economic status and interaction with friends. Women reported approximately the same level of interaction as did men, and there were not significant differences by religion or ethnic status. The employed had similar patterns of interaction to those not in the labour force. Living in a single family dwelling, household income and possessions were not significantly correlated with interaction with friends. Education was weakly positively associated with the strength of friendship networks ($r = .100, p < .01$) and home ownership was weakly negatively correlated ($r = -.093, p < .01$). For education this may simply reflect the higher education and interaction of the young. For home ownership, this may also reflect life cycle differences and an increasing emphasis on family life.

While there was a very slight tendency for those who were newer to the area to maintain more contacts with friends outside the area ($r = -.087, p < .01$), this contact tended to be relatively constant across the sample. The relatively strong friendship networks within the study area appear to be complimented by strong networks extending outside the area.

10.5 The Quality of Network Ties

Given the relatively high levels of participation within the study area, satisfaction with neighbourhoods and with friendships would be expected to be high. Such a prediction is reinforced by the high levels of satisfaction observed for family life. Results confirm these expectations(Table 10.12). Compared to Edmonton and Fort McMurray, the Cold Lake region appears to be more satisfying to its residents. On a scale of 100 points, study area residents averaged 85 on friendship satisfaction and 78 on satisfaction with neighbourhoods. Satisfaction with friendships was uniformly high in all the communities within the study area. Locale differences were not significant at the .05 level. However, locale differences were significant for neighbourhood satisfaction.

Much higher satisfaction was expressed by rural farm residents (87) and rural non-farm residents (80) than was expressed by those who lived in the three urban areas. Bonnyville averaged 78, Cold Lake averaged 75, and Grand

Table 10.12 Satisfaction with Neighbourhoods and Friendships by locale

Locale	Satisfaction with Friendships	Satisfaction with Neighbourhood	N
	Average (X/100)		
Cold Lake	84.5	75.3	158
Grand Centre	83.5	72.8	206
Bonnyville	85.7	77.5	278
Rural farm	87.8	86.5	191
Rural non-farm	84.3	80.2	105
Total	85.3	78.3	940
η^2	.008	.046	
Sig. level	.100	.001	
Fort McMurray	82.8	65.2	430
Edmonton	78.5	76.0	440

Centre averaged 73. Even then, the evaluation of neighbourhoods was still fairly positive, particularly when compared to the overall average of 65 for Fort McMurray residents.

Satisfaction with friends was not dependent on the level of interaction with friends. On the other hand, neighbourhood satisfaction was moderately correlated with knowing neighbours ($r = .334, p < .001$), and with interaction with neighbours ($r = .190, p < .001$). Long term residents were more satisfied with their friendships ($r = .144, p < .001$) and were more satisfied with their neighbourhoods ($r = .323, p < .001$). Given a large influx of new residents, some initial relatively low satisfaction with neighbourhoods might be expected as a matter of course. Extrapolating from the present results, satisfaction would probably increase as the population stabilized.

Similar differences are reflected in life cycle changes associated with aging. As age increased, so too did satisfaction with neighbourhoods ($r = .308, p < .001$). The youngest cohort averaged 67 out of 100 and this increased to 89 for the 55-65 cohort. For those over 65 there was a slight decrease in satisfaction, but levels remained high (averaging 85). As was the case for satisfaction with friendships, the higher the level of education completed, the less satisfied the respondent($r = -.214, p < .001$). This probably reflects higher expectations on the part of those with higher levels of education, although it may also reflect somewhat shorter residence in the area. Again, even the lowest levels of satisfaction (67 for those with 17 years of education or more) were higher than those recorded for the Fort McMurray sample as a whole (65).

10.6 Summary

The "community lost" hypothesis describes a situation in modern society where urbanization and industrialization have led to a shift in emphasis from primary to secondary networks. Boom towns, with their rapid population increase, high turnover, and social impermanence, preportedly epitomize such conditions.

These theories have been criticized both on logical and empirical grounds. In certain respects, they do accurately describe the strong primary networks found within the study area. Contrary to predictions derived from this theory, secondary ties appear to be relatively well-developed within the study area, despite its relatively rural nature. Indeed, rural farm residents had the highest levels of associational affiliation. With the exception of church attendance, there were few differences between Fort McMurray and the Cold Lake region in levels of formal participation. Residents of the study area did attend church more often.

Associational affiliation demonstrated the expected inverted "u" shaped relationship with age. Participation generally increased with age, and newcomers to the region appeared to be relatively quickly integrated into secondary networks. Those with higher socio-economic status reported higher participation in formal organizations, but lower church attendance.

As expected, compared to Edmonton and Fort McMurray, neighbourhood ties in the Cold Lake region were very strong. These ties appear to develop significantly throughout the adult life cycle, and residents continued to increase the proportion of neighbours known, even after they have lived in the area for some time. Integration appears to begin at a relatively high level and proceeds fairly rapidly.

Rural residents, particularly farm respondents, reported knowing a much higher proportion of their neighbours than did urban residents. The development of neighbourhood ties appeared to be somewhat truncated in Grand Centre, perhaps as a result of somewhat higher turnover. In addition to length of residence, a number of other factors had independent effects on the strength of neighbourhood ties: larger families, home ownership, dwelling type (single family), and the accumulation of household possessions. Even when all these factors were taken into account, rural residents still reported stronger networks than urban residents, and those in Grand Centre reported weaker neighbourhood networks than either Bonnyville or Cold Lake.

Friendship networks were stronger than those found in Edmonton, but no stronger than the networks in Fort McMurray. Newcomers were quickly integrated into friendship networks, and "normal" life cycle changes appeared to account for most of the systematic variation in the strength of network ties. Residents did not generally find it difficult to make or keep friends, and there appeared to be no socio-economic status barriers to participation in these kinds of networks.

As was observed for family life, satisfaction with both neighbourhoods and friendships was high. While the latter was uniformly high throughout the study area, rural residents, particularly farmers, expressed high satisfaction with neighbourhoods. Neighbourhood satisfaction increased with longer residence, and was higher among older respondents. Those with higher education were somewhat less satisfied with both friendships and neighbourhoods. This may be a function of high expectations as well as the relative youth and recent arrival of many of those with relatively high education.

11. INDIVIDUAL WELL-BEING AND ATTITUDES TOWARDS DEVELOPMENT

11.1 Introduction

In many of the previous chapters, the emphasis has been on the material well-being of respondents. These chapters examined such issues as the income, housing, and level of living of respondents. This chapter shifts attention away from material well-being to examine what will be referred to as the subjective well-being of respondents.

In examining the subjective well-being of respondents, this chapter looks at four distinct issues, the emotional state of respondents, alienation, satisfaction, and the expectations respondents hold with respect to the proposed Esso Resources plant.

In order to comes to grips with issue of the subjective well-being, the answers given by respondents from the Cold Lake region are compared, where possible with the responses given by Fort McMurray respondents to identical questions. While it is true that the present respondents differ from residents of Fort McMurray in many ways other than simply not having experienced rapid oil development, these comparisons may still give some indication of what has happened in other resource communities which have experienced rapid development.

11.2 Affect Self-reports

Respondents were asked the frequency with which they experienced various emotions. They were asked how frequently in the past few weeks they felt:

1. lonely or remote from people
2. particularly excited or interested in something
3. depressed or very unhappy
4. pleased about having accomplished something
5. bored
6. proud because someone complimented them on something they had done
7. angry
8. upset because someone criticized them

Identical questions were asked of a sample of Fort McMurray adults. Table 11.1 presents the distributions of responses to these questions for both the Cold Lake and Fort McMurray samples. The Fort McMurray data are presented in brackets. What is interesting about Table 11.1 is that there appears to be very little difference between the responses given by respondents from Fort McMurray and the responses given by respondents interviewed as part of the Cold Lake Baseline Study: Phase II. The percentage of respondents who gave each of the five possible responses does not differ in any systematic way between Fort McMurray which has undergone very rapid change in the last ten years and the Cold Lake area which is yet to experience the oil boom. For example, one would expect in a centre such as Fort McMurray where

Table 11.1 Affect Self-reports Cold Lake-Ft. McMurray

AFFECT	NEVER	SELDOM	SOME TIMES	OFTEN	VERY OFTEN	NR
Lonely/remote	47.1	25.5	19.2	4.9	2.9	0.4
	(44.2)	(24.0)	(17.2)	(8.1)	(5.6)	(0.9)
Excited/ interested	5.6	11.7	35.4	34.1	12.3	0.9
	(6.5)	(11.2)	(37.0)	(30.5)	(14.4)	(0.5)
Depressed/ unhappy	37.2	37.5	18.9	4.5	1.5	0.4
	(33.7)	(37.9)	(19.1)	(7.0)	(2.3)	(0.0)
Pleased	2.4	4.2	34.2	44.7	14.0	0.4
	(2.6)	(6.7)	(36.7)	(34.2)	(18.8)	(0.9)
Bored	42.6	24.9	22.3	6.9	3.1	0.3
	(30.2)	(24.9)	(27.4)	(10.5)	(6.7)	(0.7)
Proud	5.0	13.6	51.0	24.7	5.2	0.5
	(7.4)	(13.5)	(48.1)	(20.7)	(9.5)	(0.7)
Angry	14.2	29.7	40.2	12.1	3.5	0.4
	(9.8)	(31.6)	(39.3)	(13.3)	(5.3)	(0.7)
Upset	30.9	42.6	21.8	3.6	0.9	0.4
	(33.7)	(43.3)	(18.1)	(3.3)	(1.2)	(0.5)

population turn over is very high and where as a consequence friendships are often dislocated that respondents would be more likely to report feelings of loneliness than respondents from the small towns, villages and farms of the Cold Lake region. This does not appear to be the case. The differences between Cold Lake and Fort McMurray are marginal. Forty four percent of respondents from Fort McMurray reported NEVER feeling lonely while 47.1% of respondents from the Cold Lake region report NEVER feeling lonely. Similarly, 24.0% of the respondents from Fort McMurray reported they SELDOM felt lonely and 25.5% of the respondents from the Cold Lake area reported SELDOM feeling lonely. Similarly, the difference between the Cold Lake sample and the Fort McMurray sample is negligible with respect to how frequently respondents felt "particularly excited or interested in something." A total of 46.4% of the Cold Lake sample stated they OFTEN or VERY OFTEN felt this way and 44.9% of the Fort McMurray sample reported they OFTEN or VERY OFTEN felt "excited or interested." The difference is very small. With respect to experiencing "depression or unhappiness" again there is little difference between Cold Lake and Fort McMurray respondents. Seventy four percent of Cold Lake respondents said they either NEVER or SELDOM felt depressed or unhappy and 71.6% of the Fort McMurray respondents sais they NEVER or SELDOM felt depressed or unhappy.

The one area in which there does appear to be a difference between Cold Lake and Fort McMurray respondents is with respect to being bored. Despite the fact that Fort McMurray is a major urban centre (1979 population approximately 26,000) respondents from there are less likely to say they were NEVER bored than respondents from the Cold Lake area. Fory two percent of the respondents from the Cold Lake study area report they NEVER felt bored while only 30.2% of the respondents from Fort McMurray stated they NEVER felt bored. One possible explanation for this finding is that there may be a difference between Fort McMurray and Cold Lake respondents in terms of their respective backgrounds. The Fort McMurray sample for example are better educated and more likely to have an urban background and consequently they may demand certain kinds of entertainment and recreation that are only available in larger centres such as Edmonton and Calgary. The Cold Lake sample, being less well educated and rural and small town in background may not have such expectations and so find the facilities and services available locally to fill their needs.

There is little evidence here that the emotional well-being of respondents from Cold Lake is threatened by oil development if the experience of Fort McMurray with the Syncrude development is any indication of future conditions. The responses of Fort McMurray respondents do not seem to differ from those given by respondents from the Cold Lake area in any systematic fashion.

11.3 Alienation

The concept of alienation has wide currency in the academic community. Despite the widespread debates concerning the specific meaning of alienation, there is sufficient consensus for a working definition of the concept to be advanced. The concept of alienation typically is taken to mean a negative psychological state which develops as result of a non-fulfilling social structure.

Seeman (1959) argued that alienation had five distinct components; powerlessness, self-estrangement, normlessness, cultural estrangement, and meaninglessness. Kohn (1976) found that his measures of the first three components were the most useful. We have used a number of Kohn's indicators of these three dimensions of alienation and added several more points of our own. All of these alienation indicators were used with a seven point agree-disagree scale.

It is typically argued that life in industrialzed urban centres is more alienating than in smaller less industrialized or rural settings. If this is the case, then Fort McMurray respondents should be more alienated than Cold Lake respondents. Similarly, if Fort McMurray is an indication of past experience with large scale oil-related development, then the development of the Esso Resources heavy oil plant, the respondents from Cold Lake may over time exhibit a higher level of alienation. Table 11.2 gives the responses of Cold Lake and Fort McMurray respondents to eleven questions which tap the subjective state labelled alienation.

11.3.1 Powerlessness

Powerlessness is a subjective state which reflects the degree to which an individual thinks he has control over his own destiny. A person who feels powerful thinks that by taking action, events which impinge on him can be altered. That is, it is a psychological state which reflects the degree to which individuals feel their actions have important consequences for their future. A powerless person is an individual who feels that his or her fate cannot be

Table 11.2 Indicators of Alienation

	(1-3) % disagree	(4)	(5-7) % agree
POWERLESSNESS			
Things that happen to me are the result of own decisions	7.3	10.6	81.7
	(6.5)	(9.5)	(82.6)
Often feel powerless	55.9	17.4	26.1
	(61.7)	(13.7)	(24.0)
Confident will be able to carry out plans	5.4	10.1	84.1
	(5.8)	(7.9)	(86.1)
Anyone who works hard can get ahead	8.4	9.1	82.3
	(7.5)	(4.7)	(87.2)
NORMLESSNESS			
Alright to do anything if stay out of trouble	55.4	9.6	34.7
	(45.4)	(12.1)	(40.4)
Lasting friendships lacking in world today	26.9	16.9	55.2
	(24.6)	(13.0)	(60.7)
Most people don't believe in anything	20.8	21.3	56.0
	(19.7)	(22.6)	(55.5)
If something works, right or wrong doesn't matter	86.6	5.4	6.6
	(85.1)	(7.0)	(7.0)
SELF-ESTRANGEMENT			
I am the sort of person who takes life as it comes	10.2	8.2	81.1
	(14.0)	(8.4)	(77.4)
I often feel there isn't much purpose to being alive	91.3	3.9	4.0
	(91.3)	(3.3)	(5.2)
I feel that I am working toward some definite goal	10.9	11.3	77.0
	(6.5)	(7.4)	(85.6)

* percentages may not sum to 100% because of missing data

changed by taking action to alter the course of events. A powerless individual thinks that he has no control over what happens to him.

The issue of powerlessness is relevant to the present study because of its etiology and because of its consequences. With respect to etiology, feelings of powerlessness are thought to originate in a social environment where the events which impinge on the individual are neither predictable nor under the individual's control. Such a state of affairs can be said to be characteristic of a boom town where there is rapid change imposed on an individual by some outside agency. When events come tumbling down upon the individual, the individual may begin to feel he no longer controls what happens to him.

The consequences of feelings of powerless are no less important than the causes of powerlessness. A person who feels powerless is trapped in a vicious circle. Because he feels powerless, the individual does not attempt to exert control over what happens to him and by not taking action events rain down on him, which only serves to reinforce his feeling of powerlessness.

Respondents were asked four questions designed to tap the psychological dimension of powerlessness. As can be seen in Table 11.2, there are no systematic differences between respondents from the Cold Lake study and the Fort McMurray study with respect to their feelings of powerlessness. Eight-one percent of Cold Lake respondents and 82.6% of Fort McMurray respondents agreed with the statement that the things that happened to them were the result of their own decisions. Fifty five percent of Cold Lake and 61.7% of Fort McMurray respondents disagreed with the statement that they often felt powerless. Similarly, 84.1% of Cold Lake and 86.1% of Fort McMurray respondents were confident they would be able to carry out their plans and finally, 82.3% of Cold Lake and 87.2% of Fort McMurray respondents thought that people could "get ahead" by working hard. The differences between the Cold Lake and Fort McMurray samples are small. This lack of a systematic difference may suggest that experiencing rapid development need not lead to a chaotic world where feelings of helplessness develop.

11.3.2 Normlessness

The term normlessness refers to the degree to which the individual sees his social world as being regulated by rules which are widely accepted or by opportunism. For the individual who sees the world as being well regulated there is less insecurity and anxiety than for the individual who sees opportunism as characterizing society. For the individual who sees opportunism as characteristic of society, the social world is fraught with unseen hazards and insecurity.

The relevance of the issue of normlessness to the present study is readily apparent. Boom towns are often viewed as worlds where opportunism, financial and otherwise, is rampant. If the social life in boom towns deserves this description then it should be reflected in higher levels of normlessness among Fort McMurray respondents who have experienced rapid development for the past decade than among respondents from the Cold Lake region. As can be seen in Table 11.2 there are only small differences between Cold Lake and Fort McMurray respondents. Cold Lake respondents are more likely to disagree with the statement that "it is alright to do anything if you stay out of trouble." Fifty five percent of the Cold Lake respondents disagreed with this sentiment while 45.4% of Fort McMurray respondents disagreed. With respect to the remaining three questions which tap the issue of normlessness, there are no differences between Cold Lake and Fort McMurray respondents.

Given the difference between Fort McMurray and Cold Lake respondents with respect to the one indicator of normlessness the residents of the Cold Lake region may have some reason to be concerned about how development will affect their community. If, in fact, rapid change has a negative impact on the degree to which people adhere to the rules governing society, then Cold Lake residents may have some reason for concern.

11.3.3 Self-estrangement

Self-estrangement refers to the value the individual places on himself. With respect to this dimension of alienation, again there are few differences between the Cold Lake and Fort McMurray samples. The single question which does give some indication of a difference between respondents from the two areas addresses whether the respondent feels that he is working toward a definite goal. Respondents from Fort McMurray are more likely to agree with this statement. Seventy seven percent of Cold Lake respondents and 85.6% of Fort McMurray respondents felt that they were working toward a definite goal. This difference may simply reflect the fact that residents of Fort McMurray are people who have in a sense made plans to improve their lot by moving to Fort McMurray. Virtually all the respondents from Fort McMurray migrated to the town in the last ten years. The respondents see themselves as working toward a goal because in the past they have made such plans. This is less likely to be true of the respondents from the Cold Lake region.

If we can attribute the difference between Cold Lake and Fort McMurray respondents to Fort McMurray respondents by and large having experienced one successful move which improved their lot then the prospects for migrants to the Cold Lake region rather than the present residents appears bright. Moving to the area and improving one's lot, like any other successfully accomplished endeavour can result in positive psychological benefits.

11.4 Attitudes Towards Development

The introduction of the proposed Esso Resources heavy oil plant will undoubtedly constitute a major intrusion into the lives of the communities in the study area. Thousands will come to the area temporarily to work on the construction of the plant. Many others will come to the area to take up permanent employment at the plant and in spin-off jobs. These thousands will be coming intent on making the Cold Lake region their new home.

Many of the present residents are concerned about the changes they foresee for their communities. As part of the Cold Lake Baseline Study: Phase II, respondents were asked how they felt about the proposed Esso Resources heavy oil plant. The following section presents a review of how the present residents responded to questions concerning the building of the Esso Resources heavy oil plant.

11.4.1 Approval of Development

Respondents were asked whether they approved of the proposed Esso Resources heavy oil plant. The overwhelming majority of respondents unconditionally approved of the development. Of the respondents who answered this question, 57.7% said they approved of the development while an additional 37.3% of the respondents said they approved of the development but with certain reservations. Only 4.9% of the respondents said they did not approve of the development.

What is interesting about the reaction of respondents to the building of the Esso Resources plant is that it seems to be fairly uniform across the various segments of the community. Many of those factors which one would normally expect to influence whether a respondent approved of the development do not seem to have an effect. For example, one would expect that the prospect of the new employment to be created by the Esso development would be more important to respondents not currently working full-time than to those respondents who work full-time. As a consequence of the differential importance, one would expect those who are not currently working full-time to be more positive towards the development. This does not seem to be the case. Of the respondents currently employed full-time, 59.7% approve of the development. Almost exactly the same percentage, 55.8%, of those not working full-time also approve of the development. Approval of the development is also constant across levels of income and age. The prosperous are neither more nor less likely to approve of the development than the poor and the old are neither more nor less approving than the young. The correlation between household income and approval is -0.0004 and the correlation between approval and age is 0.07.

Approval of the project does vary significantly with how long the individual has been resident in the area, the longer one has been resident in the area, the less likely he/she is to approve of the development. For example, 59.0% of respondents who have lived in the area for more than 50 years approve of the development while 68.2% of the respondents who have lived in the area for less than 1 year approve of the development. There is a relatively constant decline in approval with increased tenure in the area. Long term residents may have a greater commitment to the local area and as a consequence may be more concerned about the possibility of development disrupting community life. The fact that long term residents are less approving of the development may account for the fact that respondents from farm households are less approving of the development. Fity nine percent of respondents from non-farm households approve of the development while only 49.4% of the respondents from farming households approve of the development. Respondents from farming households tend to be longer term residents than other respondents. Rural farm respondents have an average length of residence of 30.0 years while other respondents have an average length of residence of only 18.2 years. Similarly, the more highly educated respondents are less approving than other respondents. Only 52.2% of those respondents with 13 or more years of education approve of the development while 64.5% of those with 6 or fewer years of education approve of the development. This may also be due to differences in length of residence. SCANE IS A STRONG NEGATIVE CORRELATION BETWEEN length of residence in the area and level of education, -0.46. Respondents who have lived in the area for a long time are both less well educated and more disapproving of the development. While there are certain groups who are less approving of development than others, it should be noted that the majority of even the most disapproving groups approve of the development. They are simply less approving rather than being disapproving of the development.

11.5 Open-ended Questions

As part of this research, respondents were asked open-ended questions about several aspects of the Esso development. In an open-ended question, rather than being required to pick from a series of predetermined answers, such as degree of agreement or approval, respondents are free to express themselves as they wish. In this study interviewers were instructed to record the first three answers given by respondents.

As can be imagined, respondents gave a wide variety of answers to the open-ended questions. To analyse the answers, the individual responses made by respondents were grouped into general categories of answers. Each category pertained to a particular issue.

Once the answers given by respondents were categorized, consideration was given as to how to treat the three separate answers per questions that respondents were allowed to give. Since respondents were not asked to rank their answers, it was decided that if any of their answers fell into a broad category, that the the respondent would be coded as having given that particular class of answer. Whether only one of the respondent's answers or all three of his/her answers fell into the broad class was ignored. Similarly, whether a respondent gave a particular answer as his/her first, second or third response was disregarded. In the following discussion, the broad classes of answers given by respondents are reported. In addition, those particular answers which occur most frequently within the broad categories are also reported.

11.5.1 Suggestions for Improvement

The first question asked of respondents concerned what they felt could be done to improve the area in which they lived. Respondents were asked, "In what ways do you think life in this area could be improved?" The most commonly given class of answer to this question involved improvements in the quality and availability of leisure time facilities. Over half the respondents, 56.8%, gave at least one answer which fell into this category of response. The single most frequently given suggestion within this class of answer was that the availability and quality of recreational facilities and programs should be improved. By recreational facilities respondents were typically referring to such things as swimming pools and skating arenas.

The second most common category of suggestion pertained to the commercial facilities available in the area. Three hundred sixty five (34.0%) of the respondents suggested that this area of endeavor could be improved. The specific suggestion made most often by respondents was for the quality and availability of shopping facilities to be improved. This dissatisfaction with leisure, and commercial facilities is a recurring theme. Previous sections of this report have noted that these two areas are negatively evaluated.

The last two classes of suggestion made by a reasonable number of respondents with respect to improving the area addressed the issue of public services, planning, and political control. The specific social service programs respondents felt could be improved were programs for senior citizens, day care, and education programs for both adults and children. Day care was discussed previously as a source of concern. In addition, respondents suggested that police and fire protection could be improved. One hundred one (15.0%) of the respondents made suggestions concerning improvements in services.

Suggestions concerning planning and political control constituted the next most frequently given class of suggestion. With respect to this issue, the suggestions made by respondents did not focus on any specific issue. Rather, suggestions were made concerning a broad range of issues such as price control, the control of housing costs and land speculation, more public participation in planning, more information concerning development, and improved planning and organization.

In responding to the question of how life in the area could be improved, respondents exhibited a relatively high degree of consistency. The services which were identified in previous sections of this report as being poorly evaluated were identified here as areas which could be improved. For example, recreational facilities, day care, and shopping facilities were all identified previously as being poor. These aspects of community life were also identified here as being areas which could be improved.

11.5.2 Perceived Effects of Development on Respondents

The second question asked of respondents was, "In what ways do you think this (the Esso Resources plant) might affect you?" The answers given by respondents covered a broad range of topics from damage to the natural environment to improved medical facilities.

The answers given by respondents were grouped into nine broad categories. Some of these categories were then subdivided to distinguish between perceived positive effects of the development and perceived negative effects of the development. Table 11.3 presents a breakdown of how respondents felt the oil development would affect them. The frequencies and percentages in Table 11.3 represent the number and percent of respondents who gave at least one answer which fell into the particular category. For example, 116 (or 10.8%) of the respondents gave at least one answer which indicated they felt that the oil development would have a negative effect on the environment.

The most commonly expressed concern pertained to increases in social problems in the area. One hundred seventy four (16.2%) of all the respondents expressed some

Table 11.3 Distribution of Responses to the Question "In what way do you think this might affect you?"

CATEGORY OF ANSWER	POSITIVE EFFECT	NEGATIVE EFFECT
Damage the environment	N/A	116 (10.8%)
Crime and safety	N/A	153 (14.2%)
Social problems	N/A	174 (16.2%)
Housing	2 (0.2%)	140 (13.0%)
Services	155 (14.4%)	92 (8.6%)
Employment	148 (13.8%)	13 (1.2%)
Personal finances	79 (6.9%)	169 (15.7%)
Business	64 (6.0%)	8 (0.7%)
Population increase	N/A	64 (6.0%)
Social/psychological change	18 (1.7%)	20 (1.9%)

concern in this area. The single most frequently given reponse within this category was that there would be an influx of "undesireables/transients" into the area because of the development. The second most frequently given response concerned the expected loss of a "small town atmosphere" due to the development. By loss of a small town atmosphere, respondents meant that with development, life in their communities would become more hurried and impersonal.

The second most frequently expressed class of answer pertained to the negative impact of the oil development on the personal finances of respondents. One hundred sixty nine

(15.7%) of the respondents felt that the development would have some form of negative consequences for their finances. The specific consequence most frequently mentioned by respondents was that the oil development would produce an increase in their cost of living. *It should also be noted that this concern with an increase in the cost of living was the most commonly given single answer.*

When asked how they thought the proposed Esso Resources plant would affect them, the most frequently given response was that the development would increase the cost of living. This concern with their financial futures is reflected in both how respondents felt they have fared in the past year and how they think they will fare financially in the coming year. Compared with respondents from both Fort McMurray and Edmonton, respondents do not feel they have fared particularly well in the past year and also they feel they will not fare particularly well in the coming year. Looking first at how respondents thought they fared during the past year, approximately 42% of the Cold Lake area respondents thought they were better off. Both Fort McMurray and Edmonton respondents felt better about how they had fared. Sixty two percent of Fort McMurray and 49% of Edmonton respondents thought their financial state had improved over the past year. The respondents from Fort McMurray and Edmonton are also more optimistic about the coming year. Of the respondents who expressed an opinion as to how they felt the following year would be, 71% of Fort McMurray respondents, 53% of Edmonton respondents and only 43% of Cold Lake respondents thought that their financial condition would improve in the coming year. The respondents from Cold Lake, are less optimistic about their financial futures than respondents from both Fort McMurray and Edmonton.

While generally more respondents expect improvements in the future than reported improvements in the past year, one group, rural non-farm respondents do not. For example, 46.5% of the Cold Lake respondents said they were better off currently than they were a year previously. A larger percentage, 54.6% of these same respondents said they would be better off financially in the coming year. Seeing the future brighter than the past is typical of all respondents except the rural farm respondents. Forty five percent of the rural farm respondents said their financial condition improved over the past year while only 36.7% of these same respondents thought they would be better off in the coming years. It would seem that a pessimistic view of the future is more characteristic of the rural farm respondent than of any other respondent.

It does not appear that the source of any pessimism about the future is the belief that local businessmen are exploitative. The correlations between the two questions dealing with financial optimism and the attitude questions concerning local businesmen were not significant. The correlation between change in the past year in financial status and the attitude that businessnessmen were making a killing was -0.035 and the correlation between expectations for the coming year and the attitude that businessmen were making a killing was -0.049. The correlations between the attitude question, "A few big businessmen run things around here." and financial optimism were also small. The correlation between financial improvments over the past year and the attitude question concerning businessmen was 0.026 and the correlation between the attitude question and future financial improvements was also small, 0.062. Although respondents from the Cold Lake region are less optimistic about their financial futures than either Fort McMurray respondents, they do not attribute their situation to being exploited by local businessmen.

Not all the expected effects of development are negative. One area in which respondents feel that development will prove to be a benefit is services. One hundred fifty five (14.4%) of the respondents reported that they thought the development would improve the availability and quality of services. The specific service which was most frequently mentioned was shopping facilities. The second most frequently mentioned service which respondents felt would improve with development was recreational facilities. Shopping and recreational facilities were also the two areas cited as requiring improvement.

The fourth most frequently given class of answer pertained to increases in crime and the consequent decrease in personal safety. One hundred fifty three (14.2%) of respondents mentioned at least once that they thought development would bring with it more crime. The specific crime most frequently mentioned was vandalism. The second most frequently mentioned issue was the increased use of drugs and alcohol.

Employment is also an area which respondents feel will be improved because of the development. The proposed Esso Resources development is seen as producing improvements in employment opportunities in the area. One hundred forty eight (13.8%) of the respondents mentioned this as a positive effect of development. Respondents expect that with development there will be a general increase in the number of jobs available.

Housing is expected to be negatively affected by development. One hundred forty (13.0%) of the respondents reported that they felt housing would be negatively affected. Specifically they see housing and land prices increasing. Considering that many respondents felt that the cost of living would increase in the study area, it is not surprising that there is some concern over the cost of housing in the future.

The last area of concern expressed by a significant number of respondents was the environment. One hundred sixteen (10.8%) of the respondents felt that the development of the Esso Resources heavy oil plant will lead to environmental damage. Water and air pollution were the two leading areas of concern.

The respondents in the Cold Lake area see life being both positively and negatively affected. Increases in social problems, increases in crime and loss of neighbourliness are seen as some of the socal costs of development. In addition, they see that development will bring with it a higher cost of living. At the same time development is expected to bring much needed new employment to the area. It would appear that respondents are neither unrealistically pesimistic about the future nor unrealisically optomistic.

11.6 Who Benefits Most?

Whenever a major development such as the proposed Esso Resources heavy oil plant enters an area, a common topic for debate centres on who will benefit most by the development. To determine how respondents felt about this issue the following open-ended question was asked. "In your opinion, who will benefit most from the proposed ESSO development?" Almost three quarters of the sample, 796 (74.0%) felt that various businesses will profit most from the development. Leading the list of companies seen as benefitting were the large oil companies. (Approximately 39% of the respondents gave oil companies as their first response to this question.) Following the large oil companies, respondents saw local companies being major beneficiaries of the development. Parenthetically, it should be noted that respondents from Fort McMurray, when asked who had benefitted most from development, also identified big business and in particular, the major oil companies.

The second group which is seen as benefitting most from the development is comprised of various Canadian groups outside the local community. This category of "winners" includes Albertans in general, the Government of Alberta, "Easterners", and the Federal Government. Within this group, it is the Government of Alberta which is seen as the leading beneficiary of development. Two hundred eight-one (26.1%) of the respondents stated that in their opinion various Canadian groups outside the local community would benefit most from development.

While a large number of respondents felt that groups outside the local community would benefit most from development, a significant number also saw various local groups as being major beneficiaries of development. Two hundred twenty five (20.9%) of the respondents identified one or another local group as benefitting most. The respondents saw themselves (i.e. the local population) as being a major "winner" along with the local municipalities.

The last two categories of individuals described as benefitting most from development were various occupational groups and the economic elite. One hundred ninety nine (18.5%) of the respondents said that various occupational groups (Esso Resources employees and the unemployed in particular) would benefit most from development. With respect to the 191 (17.8%) respondents who identified an element of the economic elite as gaining most from development, a large number stated that it would be the landowners and the speculators who would benefit most from development.

11.7 Who Benefits Least?

The last open-ended question asked of respondents addressed who they felt would benefit least from development. The category of answer most frequently given was defined in terms of occupations. Three hundred fifty three (32.8%) of the respondents mentioned one or another occupation as benefitting least from development. The specific occupation which was seen as benefitting least was farmer. In fact farmer was one of the most frequently given answers to this question. The next most frequently identified occupation which was seen as benefitting least from development was the military.

Following groups defined in terms of occupation, various local groups were seen as benefitting least. Approximately one quarter, 276 (25.7%) of the respondents mentioned a local group which they thought would benefit least from development. Within this broad class of answer, it was the Indians, the people of the area in general, and the original residents (homesteaders) who were seen as benfitting least from the development.

Almost an equal number of respondents thought that groups defined in terms of their demographic characteristics and location in the social structure would benefit least.

Two hundred sixty four (24.6%) of the respondents thought that individuals defined in terms of their demographic characteristics would benefit least. In particular, the aged/retired were seen as benefitting least. Two hundred forty two (22.5%) of respondents thought that individuals located at particular points in the social structure would benefit least. The average working person, people on fixed incomes and the working poor were seen by many of the respondents as benefitting little from the development.

11.8 Summary

This chapter has examined the subjective state of respondents, their emotional state, their perception of themselves, and their attitudes towards the proposed Esso Resources heavy oil development. The majority of respondents approve of the development, and this approval with a few exceptions appears to be fairly uniform across the various segments of the local community.

Respondents have definite ideas about how their communities can be improved. The two most commonly given suggestions were that the quality and availability of leisure facilities should be improved and that commercial facilities, especially shopping facilities could be improved. Respondents also had definite ideas as to how the development would affect them. The most commonly given answer as to how the development would affect the respondent was that there would be an increase in social problems. More specifically, respondents expressed concerns about an influx of "undersireables/transients" into the study area as a result of the development.

There was a relatively high degree of consensus as to who would benefit most from the development. Respondents consistently felt that it would be the large oil companies who would benefit most from the development. The group seen by respondents as benfitting least from the development was various occupation groups and in particular farmers and military personnel.

12. CONCLUSIONS

12.1 The pre-impact Baseline

12.1.1 Purpose of the Study

Imperial Oil Ltd. has proposed to construct and operate a commercial bitumen extraction and upgrading facility in the Cold Lake area. The present study was commissioned by the Government of Alberta to establish a socio-economic baseline against which to assess changes that may result from this development. The object of this pre-impact survey of the Cold Lake region has been to understand the existing socio-economic systems within the region (Figure 1.1). This is necessary to facilitate the separate identification of: 1. changes that result from the construction and operation of the Imperial Oil facility in the Cold Lake area; 2. changes that may arise as a consequence of conditions and processes already present in the region. The research design seeks to enhance present methods of impact assessment so as to improve the empirical basis for the formulation of development policy.

This report has presented the preliminary analysis of available secondary census data and primary survey data collected in interviews with a representative sample of adults resident in the region. Analysis has focused upon the general population of the area: the three towns of Bonnyville, Grand Centre and Cold Lake, three nearby villages (Glendon, Fort Kent, and Ardmore), and the surrounding rural area. Survey results for both CFB Cold Lake and the Metis settlements of Elizabeth Lake and Fishing Lake are presented in separate special population reports (Nos. III and IV).

12.1.2 Research Design

In selecting a sample to represent the study area, the dwelling was used as the primary sampling unit, and one adult was interviewed from each dwelling selected. Disproportionate interval probability sampling was used with sampling fractions ranging from 1/3 in the villages to 1/6 for Bonnyville. This was done to better represent the smaller populations within the study area. Analysis therefore required the use of weighted estimates based on 1311 subjects whereas only 1075 interviews were conducted. Omitting CFB Cold Lake gave a weighted sample size of 940.

Interview completion rates were about 82% overall, ranging from 85% in Grand Centre to 72% in the villages. The latter rate was relatively low because of problems with contacting respondents. Of those contacted in the villages 81% responded to the interview. The sample over-represented females because they had lower refusal rates than males. It was, however, representative for sex-specific age distributions when compared to results for the 1976 census. While the rural portion of the sample appeared to have fewer young men and women than predicted on this basis, these differences appeared to be the result of actual change.

Reliability of measurement, ascertained with telephone call-backs, was high for simple factual questions and short-term recall items, and was satisfactory for attitudinal items.

The large sample size was necessary to adequately represent the different population components of the study area, and to insure satisfactory samples for future panel studies of the same respondents. Generally speaking, reliability of measurement was high , there was a good response rate, and the sample proved to be representative. It will form a very satisfactory basis for future data collection.

12.2 The Impact of Development:Speculative Hypotheses

Throughout this analysis of pre-impact conditions, a number of methods of establishing a dynamic baseline have been utilized. These methods have been directed at identifying change that has been occurring within the area. Simple extrapolation from trends in census data provides one method of generating predictions of changes that may occur within the area. Comparison of synthetic age and migration cohorts and the use of the individual as his or her own "control" has helped to identify what we have called "normal" life-cycle change. These changes too may be projected on the basis of knowledge of possible demographic change. Finally, we can compare conditions in Fort McMurray with those in the study area. This provides a very crude, implied before and after comparison of the effects of development. However, in order to make such comparisons clear, it is necessary to emphasize the similarities and differences between the two areas. These methods are utilized to infer possible changes that may occur in the area, both from trends already occurring in the region, and from possible future developments.

12.2.1 The Demographic Basis of Change

On the basis of preliminary analysis of available census data, Grand Centre and Bonnyville appeared to be the most viable communities from a demographic viewpoint. This conclusion was based primarily on their population growth in the youth and working force segments of their populations. Given past fertility declines, this population will have to be offset by continued in-migration. Past declines in fertility will thus increase the need to encourage in-migration to the area, particularly given increased labour demand. As a consequence of ESSO's proposed development, the dependency burdens of the towns of Grand Centre and Bonnyville will likely continue their downward trend. In the case of Bonnyville, this will be slowed somewhat. Given existing services and facilities, Bonnyville will likely continue to be an attractive community for the retired and widowed population. This is one way in which Fort McMurray differs from the Cold Lake area, since Fort McMurray has a very low proportion of population 65 or over.

Given increased in-migration of young adults, the increase in the proportion of older respondents will probably decline.

Indeed, if Fort McMurray is any example, the population that migrates to the area will probably contain a high proportion of young, married adults with children (or with children born after arrival). This will tend to increase the young dependency ratio, and will create increased demand for services for children (daycare, health services, schools). Labour force participation will likely continue to increase, primarily as the result of increased participation by females. This trend may be accelerated by the creation of jobs through the multiplier effects of plant development. For example, the labour force participation rate for females in Fort McMurray was calculated at about .46, somewhat higher than that for the study area. Such changes would probably increase the demand for daycare services, particularly among new migrants to the region who are less likely to have easy access to alternative arrangements (for example with kin).

The trend towards increased urbanization within the area will probably continue as young people leave the farms for employment in urban settings, and retired or widowed respondents move into the towns within the area. Given increased employment opportunities within the area, workers entering the labour force may be more likely to remain within the region. With an expected influx of single migrants, the marriage rate may drop slightly from its presently high levels. The trend towards an increasing percentage of those who are divorced will probably continue, and may increase at a faster rate than previously.

Population stability is presently much greater within the study area than it is in New Towns such as Fort McMurray. Given the presence of a large stable population that has lived in the area for a long time (an average of 21 years), the in-migration associated with project development will have a reduced effect on population stability. Given the intention of present residents to remain in the area, turnover may be somewhat lower than has been experienced during construction booms in other circumstances. A baseline panel study of turnover would be necessary to study such effects.

If in-migration streams are similar in social composition to those experienced by Fort McMurray, new migrants are more likely to come from backgrounds unlike the study area (ie. large urban areas). They will also be somewhat more likely to come from outside Alberta, and will be more likely to come from Ontario or the Maritime Provinces. Higher migration to the study area of young, highly educated, single adults from outside the province will probably decrease the population stability within the region.

12.2.2 Occupations and Incomes

Employment rates in the study area are somewhat lower than those for the province as a whole. This may result from a higher proportion of under-reported jobs among females working on family farms, but also probably reflects the relative scarcity of employment opportunities within the study area. As the proportion of those over 65 years of age decreases with in-migration of young workers, participation rates will increase. Female participation in the labour force is likely to continue to increase, particularly in service sector jobs created with development. This will probably lead to an increase in the proportion of married couples with two earners in the household, and this will increase household incomes.

In terms of their work histories, those employed full-time in the labour force within the study area were highly stable. They had held few jobs and experienced few periods of unemployment. If in-migrants to the area are like those who have moved to Fort McMurray, new migrants to the Cold Lake region may show considerably lower work stability than present residents. Instability among present residents may be increased by an increase in job switching. Given present patterns of job search, it appears that the young would be more likely to be attracted to work connected with the new plant or the jobs that it creates in the local economy. Those who are employed, but not for the full twelve months of the year are also more likely to switch jobs.

Among this group, females appear to be more likely to switch jobs than males. If there are increased employment opportunities for females, the wage rates for the kinds of jobs which they hold may increase. In addition, there is more likely to be the perception on the part of residents that there are equal employment opportunities.

The present occupational distribution of the study area is highly diversified, with farming and armed forces the two most frequently reported occupations. If development proceeds as planned, both these occupations will form a lower proportion of the occupational distribution, and managerial, professional and technical workers will probably form a considerably higher proportion than their current 18%. There will probably also be an increase in craft, production, processing and construction jobs, with the latter being most prevalent at the time of plant construction. Overall, these shifts will result in an occupational distribution which has higher prestige jobs. Present sectoral distibutions of occupations by industry will also change towards a higher percentage of jobs in the construction industry, and a higher proportion of jobs in the mining, quarries and oil industry.

Farm incomes appear to be relatively low compared to those for Alberta as a whole, and this is unlikely to be altered by the proposed development. Farmers estimate their land to have a high value, however, reflecting the rising expectations that accompany proposed development. This is similar to the value placed on dwellings by home owners. In terms of individual incomes, the proposed development may see a weakening of the relationship between education and income. If the situation in Fort McMurray is any indication, there may be little association between education and incomes in the jobs created by development.

Household incomes were also relatively low for the study area, averaging about $17000 compared to the Alberta average of about $18400. With development, incomes would be expected to increase. However, if the experience of other communities is any guide (Summers et al., 1976), migrants to the region may make higher incomes than present residents. The latter are less likely to have the relevant skills necessary to obtain high paying jobs associated with the construction or operation of the new plant. This may see an increase in income disparities within the region, particularly since many residents (older, retired, unskilled) may be unable to take advantage of new opportunities. To the extent that there is a general increase in the demand for labour within the area that increases general wage rates, such effects will be dampened.

Similar effects may be observed for fringe benefits. At present, those who work for DND and the government get the highest fringe benefits. The new jobs created with the development of the ESSO plant may carry with them extensive fringe benefits that are unlikely to be extended equally to all segments of the labour force.

The standard of living within the area is presently fairly high. Compared to Fort McMurray, residents of the study area reported the same or more household possessions. Standards of living may rise with development, but may affect different segments of the population differently, depending on opportunities for earning incomes. Debt in the Cold Lake region also appeared to be relatively high, but high debt was more a characteristic of farmers than those who lived in the urban areas of the sample. Their reported levels of non-mortgage debt were similar to those of Fort McMurray residents. However, it should be remembered that the residents of Fort McMurray presently earn higher incomes than the residents of the Cold Lake region. They can afford a higher debt burden. This is one factor that will bear close monitoring as development proceeds.

12.2.3 Housing

The housing stock of the towns in the Cold Lake region appears to have roughly kept pace with growth in population. Most of the new stock added has been single family dwellings, leaving the area with a high concentration (77%) of this kind of housing. Rapid population growth and high development and construction costs may necessitate expansion of other kinds of dwellings, particularly multiple family housing and mobile homes. Given the present low evaluations given to higher density areas, such housing may be relatively difficult to adapt to the local population's preferences. However, it will probably be utilized primarily by new residents.

Given the large stock of single family housing presently available within the area, in-migrants may find it somewhat easier to purchase that kind of accomodation than they did in Fort McMurray. However, there is some evidence that present residents place very high evaluations on their dwellings, perhaps in anticipation of higher demand. While present shelter costs are relatively low, particularly for residents who have lived in the area for some time, the same may not be the case for new migrants. Also, to the extent that the development of new services requires increased taxes, the shelter costs of those on fixed incomes may increase, even if they hold no mortgage. While the present residents of the area are relatively positive in their attitudes towards their housing, there is no guarantee that this will be the case for new migrants to the area.

12.2.4 Services

Respondents to the 1979 survey identified several areas in which they had a relatively high frequency of problems: shopping, and recreation and entertainment. The latter problem was also reported frequently by the 1979 AOSERP sample of Fort McMurray. The two areas differed in the proportion of residents who reported experiencing problems with shopping facilities. Fort McMurray did not indicate that shopping facilities were particularly deficient.

Indeed, as the respondents themselves expect, retail shopping facilities in the study area may improve given the increase in demand that will accompany the construction and operation of the ESSO plant. This improvement will probably considerably exceed that which would occur without such development.

The design and maintenance of streets, roads and sidewalks was rated poorly in both the study area and in Fort McMurray. Given the pressures on such municipal services during rapid population growth and its attendant construction, future development may pose some problems in this area. Generally, people in the Cold Lake area reported fewer problems in obtaining household or car repairs, or specialized medical or dental services than did a comparable sample in Fort McMurray. While protection services and schools were rated fairly highly in both areas, daycare facilities were rated as very low quality by the sample in the Cold Lake region. Residents of the Cold Lake region rated the safety of their neighbourhoods more positively than did residents of Edmonton. Fort McMurray residents also reported more problems with vandalism and theft. Individual expectations on the part of Cold Lake residents that such problems might increase with the proposed development seem to be confirmed by the experience of Fort McMurray residents, if it is anything to go by.

There is some indication from analysis of both the Cold Lake area data and that obtained from Fort McMurray, that the in-migration of young, educated adults will decrease satisfaction with services. Younger, more highly educated respondents in both samples were likely to be less satisfied with services, perhaps because they had higher expectations than other residents.

12.2.5 Participation and Network Strength

12.2.5.1 Family and Kin

The study area exhibited a high proportion of married couples as well as a growing proportion of divorced. Respondents felt that family breakdown was fairly common, but compared to residents of Fort McMurray, they were much more positive in that regard. Couples in the Cold Lake region reported lower rates of marital disagreement, particularly concerning money and housekeeping. If the reputation of Fort McMurray is anything to go by, family problems may increase in the study area with an influx of new migrants.

Even though fertility rates throughout the Cold Lake area have been declining for some time, they remain higher than comparable figures for Fort McMurray. The population that migrates to the Cold Lake region may exhibit lower fertility than present residents of the area. This could slightly reduce pressures on services for children. However, present residents of the study area already feel that there are severe difficulties in activities for teenagers and in the provision of daycare services. According to residents' opinions, these problems are more severe than they are in Fort McMurray, even in the present pre-impact stage of development of the Cold Lake region.

However, these problems did not appear to affect residents' perceptions of the study area as a place to live and raise a family. The area received much higher ratings on this score than did Fort McMurray. Even so, family satisfaction was very high in both areas, and varied little within the respective communities. It was not influenced by length of residence, except to the extent that interaction with local relatives seems to have assisted in the initial adjustment of newcomers to life in Fort McMurray. Given the considerably stronger kin networks present within the study area, some new migrants may have ready access to local informal support systems if migrants already have friends or relatives within the area. If there is an effort to recruit local residents for new jobs, such efforts may be extended by the residents themselves to include friends and relatives from outside the region (Granovetter, 1974).

12.2.5.2 Formal Associations, Neighbours, and Friends

Participation in formal and informal networks was relatively high within the study area. Membership and participation in voluntary organizations was just as high in the study area as it was in Fort McMurray, and despite low population stability, the latter place showed no negative impacts of rapid development (Gartrell et al., 1980). While the rural portions of the study area might have been expected to show relatively low associational membership rates, this did not turn out to be the case. Indeed, just the opposite was observed. Based on what has happened in Fort McMurray, there appears to be a relatively low probability that participation in formal organizations (including volunteer work) will be negatively affected by rapid development.

The only area of formal participation in which there was a significant difference between the study area and Fort McMurray was in church attendance. Given the patterns of attendance observed within both places, an influx of new residents may see lower attendance rates (for the highly mobile, young, highly educated).

Informal network ties, particularly neighbourhood ties, were very strong. While Fort McMurray showed no negative effects of rapid development in this regard (it had just as strong neighbourhood ties as did Edmonton), the Cold Lake region showed much stronger local neighbourhoods. To the extent that the study area (particularly the urban portions of it) receives a high influx of new migrants, neighbourhood integration will probably be lowered. The primary reason which explained the development of strong neighbourhood ties within the study area was the relative stability of the population. However, even for new migrants to the area, ties appeared to be relatively well developed. Since there was continuing increase in the strength of neighbourhood ties over quite a long period of residence, an influx of new residents may disrupt patterns of integration. Since there appeared to be somewhat slower integration into neighbourhoods in the Cold Lake region than there was in Fort McMurray (even if the starting level was higher), integration of new migrants may be difficult unless institutional mechanisms are developed to assist in the process. These difficulties may be compounded by the relatively low church attendance expected of mobile, young, highly educated migrants. Churches appear to provide one of the focal points for social networks within the various communities of the Cold Lake region.

Neighbourhoods exhibited stronger ties in the study area, but friendship networks did not. In this latter respect, networks seemed to be developed even more rapidly in Fort McMurray, perhaps because of the emphasis placed on this kind of interaction by the young. These networks may become more important within the study region even as neighbourhood and kinship networks become relatively less important. However, the rural area within the Cold Lake region will probably continue to exhibit very strong support networks.

Satisfaction with friendships was high in the study area, as it was in Fort McMurray. Little change can probably be expected in this regard. However, satisfaction with neighbourhoods was much higher within the study area than it was in Fort McMurray. There may possibly be some deterioration in this indicator with the provision of multiple family housing and the high influx of new residents who are young, well educated and highly mobile. However, given conditions as they presently exist within the study area, neighbourhood satisfaction will probably remain at levels which considerably exceed those in Fort McMurray.

12.2.6 Individual Well-being

Individuals interviewed in the Cold Lake region reported feelings (affect) that were little different from that reported by a similar sample from Fort McMurray. They were not more or less likely to report positive emotions (being excited, pleased, proud) or negative emotions (unhappy, angry, upset). Residents of the Cold Lake region were less likely to report that they were bored, perhaps because they had lower expectations. At any rate, their negative evaluations of recreation and entertainment within the region do not appear to have created problems in this regard.

Alienation too was similar to that reported by respondents in Fort McMurray. There were few differences in powerlessness, although normlessness appeared to be a little higher in the Cold Lake region and respondents were somewhat less likely to report working towards specific goals (self-estrangement). If anything, respondents in the study area appeared to be a little more alienated despite (or perhaps because of) the fact that they were not yet involved in rapid development.

12.2.7 Residents' Attitudes Towards Change

In their attitudes towards development, suggestions for change, and predictions as to the effects that development will have on them personally, respondents themselves were asked to provide much of the same information as we have reviewed above. It is appropriate, therefore, that they get the "last word", so to speak. It should be emphasized that respondents were generally in favour of development. Less than 5% disapproved of the development proposed by Imperial Oil, and only about 37% expressed any reservations with their approval. While all segments of the popuation were basically in favour of the development, those in the rural area, long term residents, and those with high educational levels tended to be less approving.

Who respondents think will benefit most from the development is an indication of how they feel the development will affect them. Almost three-quarters of the respondents felt that either the oil companies or local business would be the principal beneficiaries of development. Furthermore, groups outside the region were named as prime beneficiaries more often than were local people. These groups included Albertans in general, the Government of Alberta, Easterners, and the Federal Government (all Canadian). This perhaps captures some of the problems that individuals see in this kind of development.

Those who they thought would benefit least were specific occupational groups - the military (CFB) and farmers. This appears to be a fairly accurate assessment, since the former will probably not even be in the area when development occurs (because of frequent transfer), and the latter will not participate directly in development at all. Local people, particularly Indians, the original residents of the area, or just the people of the area in general were mentioned next often as those who would benefit least. While people are in favour of the development, they do not see local residents as the prime beneficiaries.

The opinions of Fort McMurray residents are interesting in this regard. Like the residents of the Cold Lake region, the residents of Fort McMurray pick local business and the large companies involved in the development itself as the prime beneficiaries of development. However, they were more likely to name workers in general as beneficiaries of the development, probably reflecting the benefits that they saw through the provision of employment. Of course, there were no farmers or military personnel within the population of Fort McMurray, so it is hardly surprising that they were not named as non-beneficiaries. The second more frequently named group was again composed of local residents: the native population and old-timers (or original residents of the area). Whether these opinions are accurate or not, the similarity of views in the two regions is interesting. However, it should also be noted that approval for development in the Cold Lake region appears to be high despite such appraisals.

Something of the same sort appears to be the case when individuals evaluated their own future and the effects that development might have on them personally. Residents of the Cold Lake region were far less optimistic about their short term financial futures than were residents of Fort McMurray, and they were also less likely to report improvements in the recent past. However, this does not appear to have influenced their approval of development. Indeed, when they assessed the consequences for themselves, residents were over twice as likely to report negative effects as to report positive effects. Some saw services improving with development and the larger population base. These improvements were predicted precisely in the areas where respondents reported the most problems, and gave some of the poorest evaluations: in the provision of recreational facilities (particularly swimming pools and arenas), and in the development of better and more varied retail shopping facilities within the area. Respondents also saw positive impacts in terms of employment, but this was mentioned by fewer than one might expect (14%). With the high labour force participation rates within the area, increased demand for labour might be widely seen as favourable to those already in the local market. This, however, does not appear to be a widely held opinion.

The reason probably lies in the relative lack of financial optimism about the future, and this in turn is reinforced by the perception that development will bring an increase in social problems (particularly with the influx of undesirables and transients), and have a negative influence on personal finances. The latter is seen primarily in an expected increase in the cost of living. Indeed, this was the single most frequent answer that respondents gave to the question of "how will this affect you personally?".

In addition, many respondents also expected a decrease in their personal safety and an increase in crime. This was seen particularly in vandalism, and in the increased use of alcohol and illegal drugs. Impressions about increases in the cost of living were also expressed in the opinion that housing costs would increase, and some respondents also felt that water and air pollution would be a problem. Again, however, it is worth noting that these problems did not appear to be serious enough to bring respondents to develop negative attitudes towards the development itself.

Respondents suggestions for improvement appeared to be highly consistent with problems identified. The primary problem area appeared to be the quality and availability of leisure and recreation facilities, and this was also the area in which most suggestions for improvement (57%) were made. Retail shopping was also a problem, and this too received a large number of suggestions (34% of the sample mentioned it). Indeed, public services such as fire and police, or specific services for groups such as the young (daycare) or senior citizens, were mentioned in suggestions in only about 15% of the cases. Improvements in planning and control were mentioned even less frequently.

This situation appears to be very different from that in Fort McMurray. There recreation was mentioned less often, although finding good recreation was often a problem for respondents. Improvements to retail facilities seemed to be much less of a problem there, since it was the fifth most frequent area in which suggestions were made. In Fort McMurray it was roads and transport which received the highest number of suggestions for improvement, followed by factors related to the asthetic appearance of the town. This may be a reaction to the construction that has taken place within the area, and may yet prove to be the reaction of local residents within the Cold Lake region as well.

12.3 Recommendations for Future Study

This analysis has not attempted to provide recommendations for the development of programs within the area. Rather, it has attempted to provide the kind of empirical information that is necessary to that attempt. Positive efforts must be initiated in order to apply this information to the formulation of development policy.

Such efforts will almost surely create the need for different kinds of analyses than are presented here. This report has attempted to describe and analyse a large number of indicators that attempt to characterize the demographic and socio-economic dimensions of the study area. In doing so, it must inevitably be selective, and in its selectivity, it probably has missed analyses relevant to the needs of particular efforts at policy formulation. We must rely upon the users of this report to keep asking questions. Only in that manner will the information be put to its fullest use.

Indeed, one series of questions has already emerged from the analysis to date. A single survey cannot adequately estimate turnover. It can only draw indirect references from indicators such as number of previous moves and length of residence within the region. If a baseline is to be created for turnover, the sample must be reinterviewed, and movers distinguished from stayers. In this sense, the 1979 survey could of course interview only stayers. A follow-up panel study of both the stayers and the movers from this first sample would be necessary to estimate pre-impact turnover. Since such a study would interview those who had left the area, it could be designed to assess reasons for mobility, and the kind of new circumstances that appear to attract respondents to move out of the area. This would be in addition to analysis of the demographic and socio-economic characteristics of the stayers and movers. Such information would later allow the assessment of the degree to which turnover is attributable to factors already present within the region before the development is begun. It would then be possible to begin to identify turnover that was a consequence of new development within the study area. Such a study would probably best be planned for the spring of 1980, provided that field work was completed before any significant development began. This would allow time for the maximum amount of turnover to occur, and would provide a satisfactory number of movers to study.

The highest payoffs from this research will come only when longitudinal information is available. In order to collect such information, a combination cross-section and panel design is suggested in Report VI. Only when we have information from several points in time can we begin to assess in detail (beyond assessments based on available data) the socio-economic impact of changes brought about by the development of large energy-related production facilities. While we can begin to create the information necessary to development planning now, the highest returns will be in the future.

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APPENDIX

1. Figures 1.3 to 10.4: pages 348 to 378.

2. Tables 2.1 to 10.12: pages 379 to 470.

Figure 3.1 Age and Sex Distributions

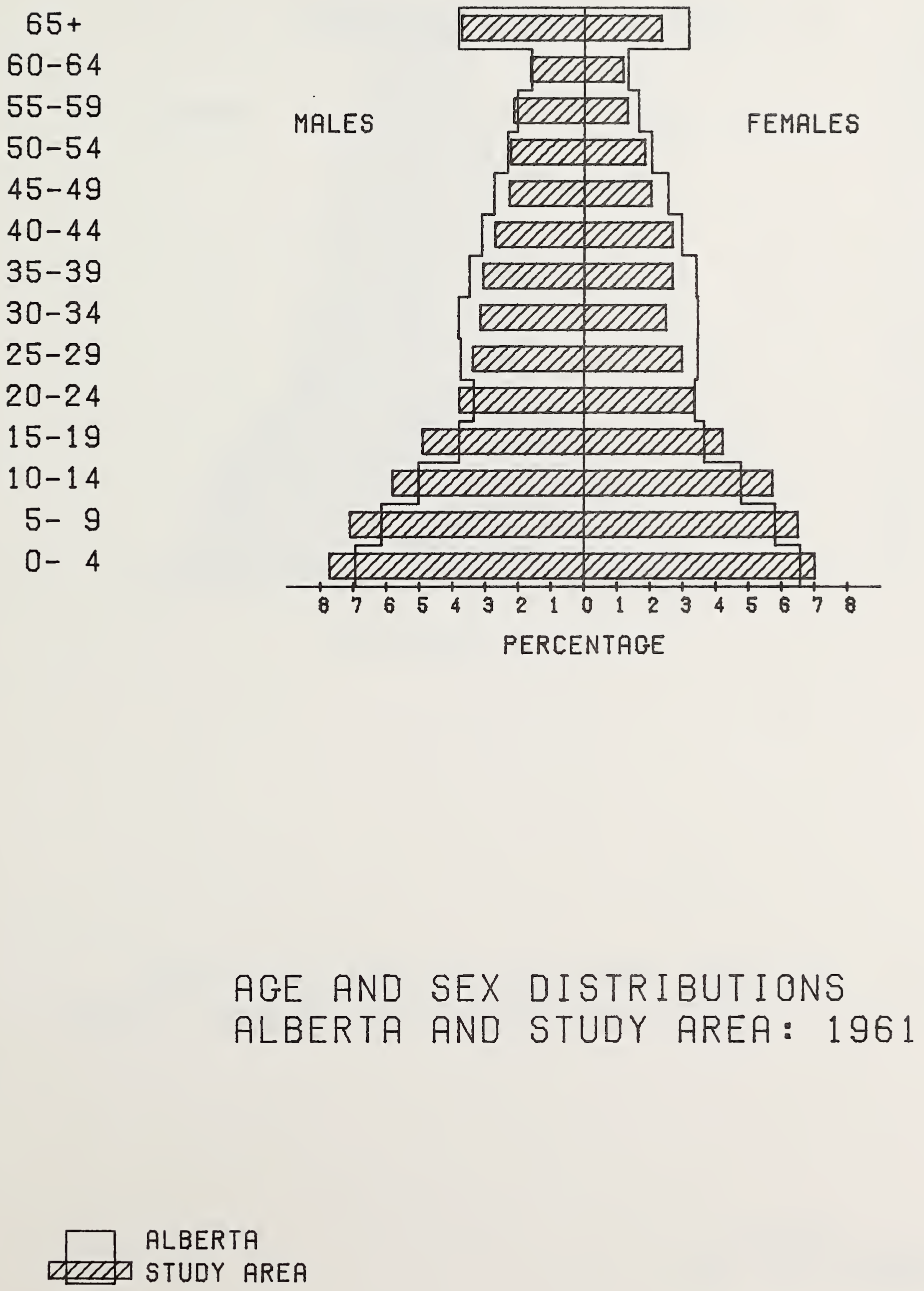


Figure 3.2 Age and Sex Distributions

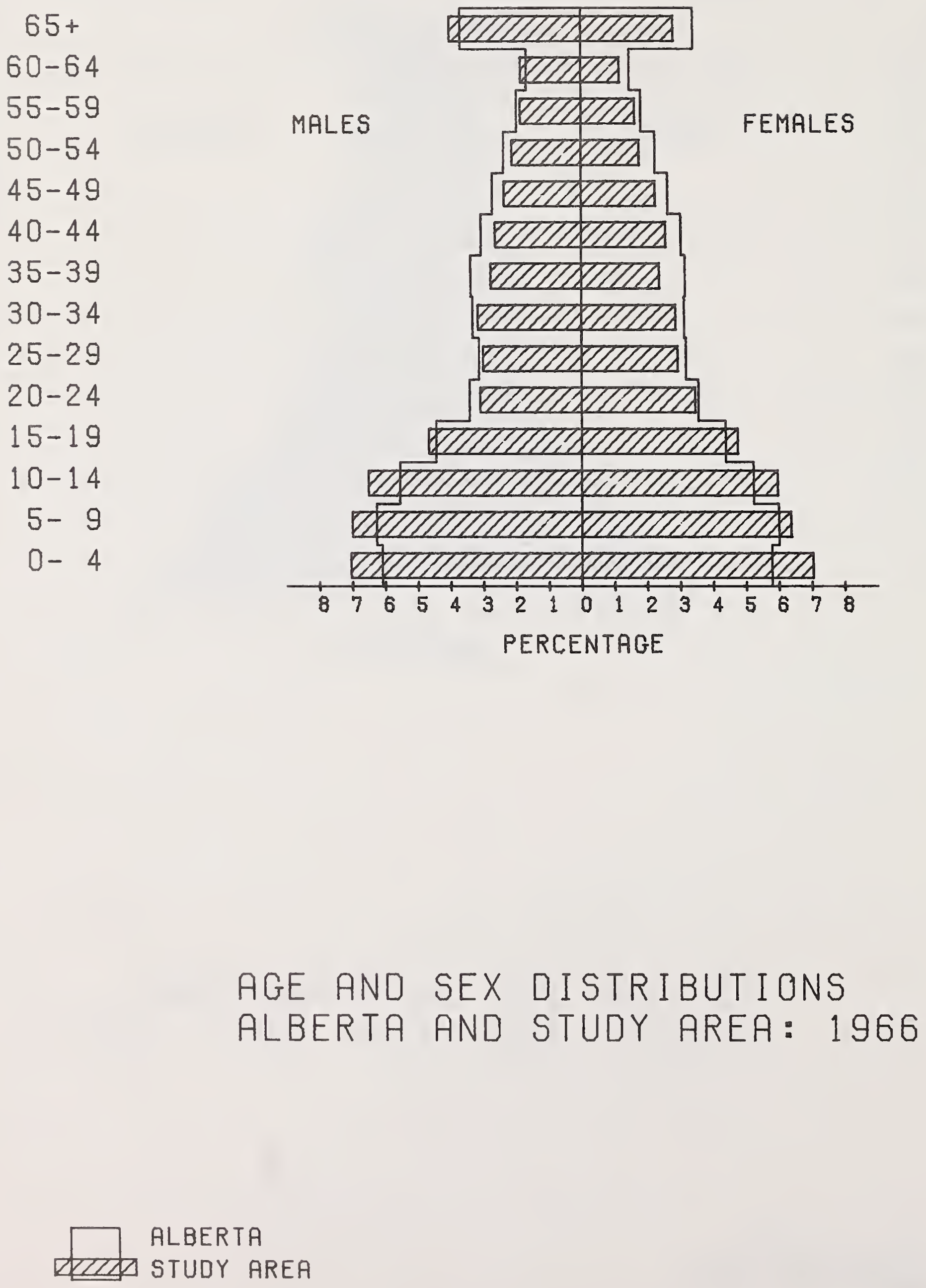
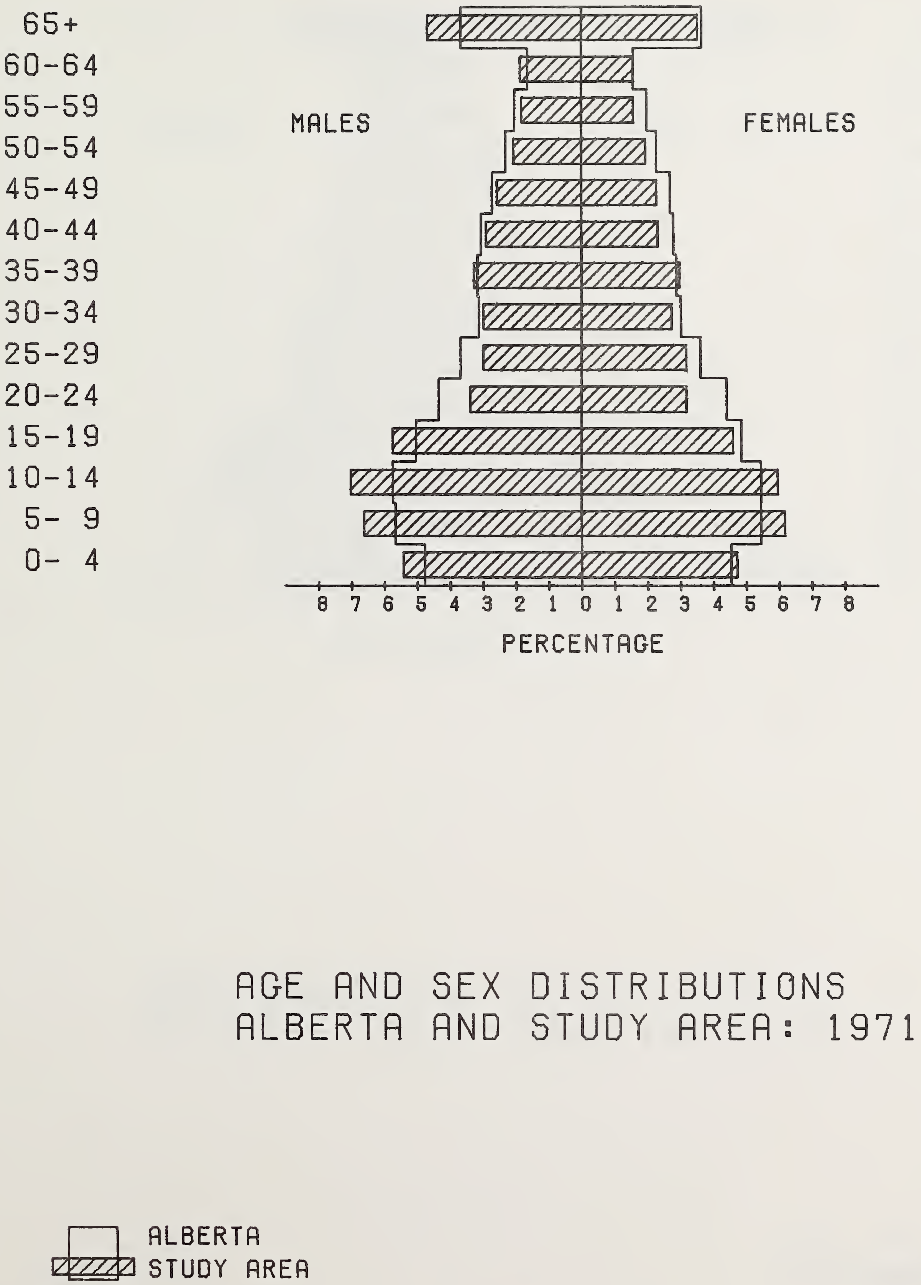


Figure 3.3 Age and Sex Distributions



AGE AND SEX DISTRIBUTIONS
ALBERTA AND STUDY AREA: 1971

Figure 3.5 Age and Sex Distributions

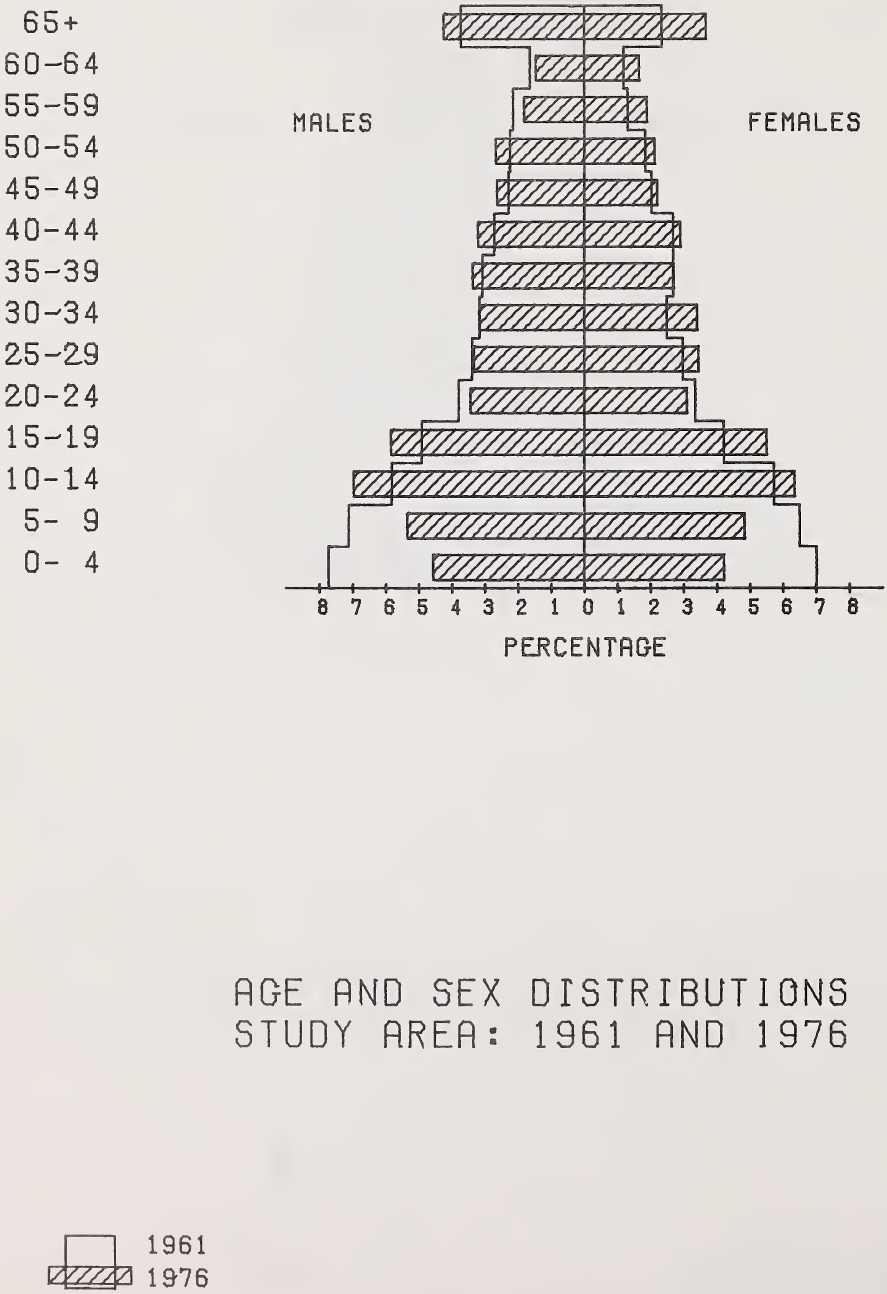
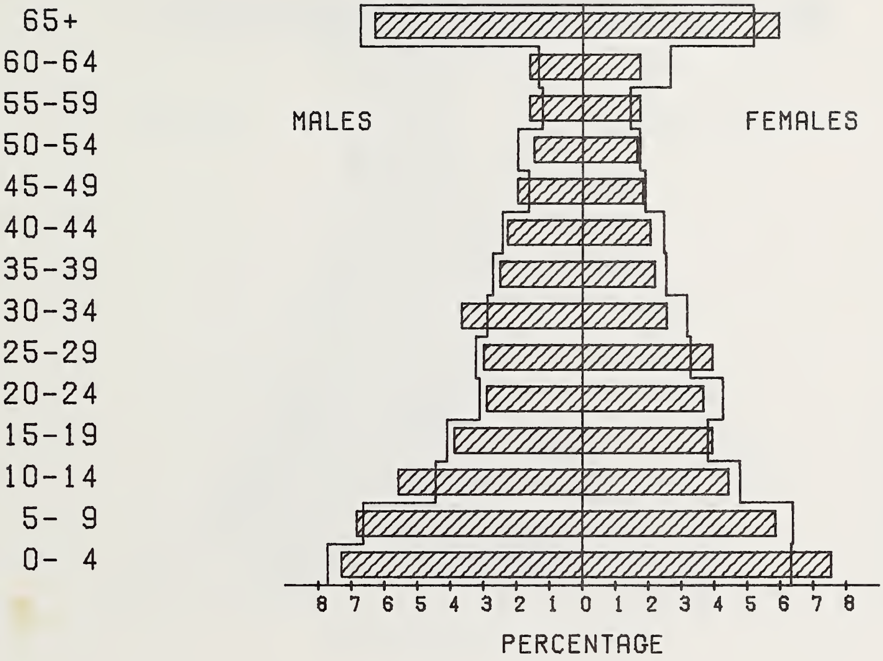


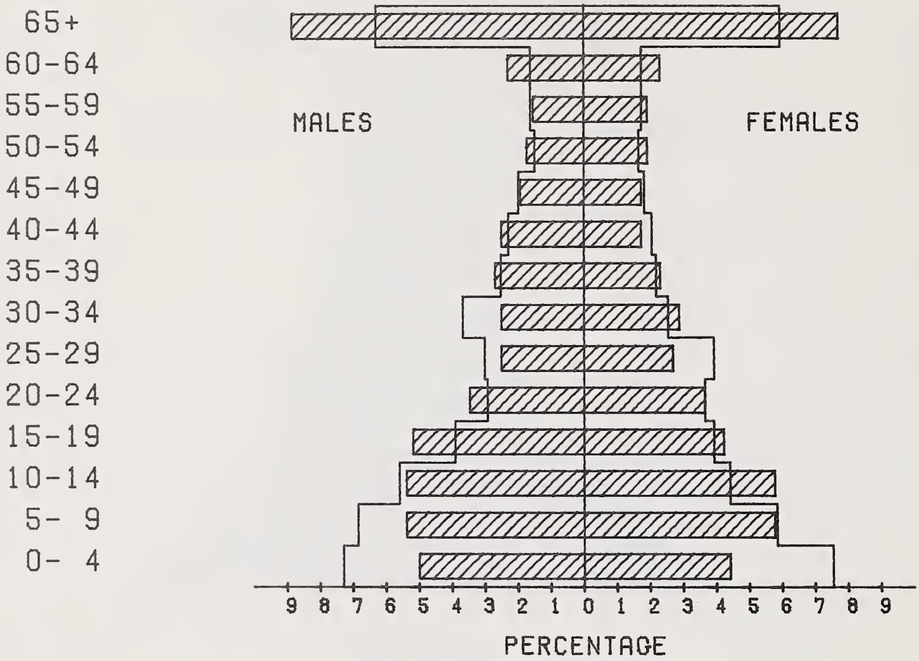
Figure 3.6 Age and Sex Distributions



AGE AND SEX DISTRIBUTIONS
BONNYVILLE: 1961 AND 1966

□ 1961
▨ 1966

Figure 3.7 Age and Sex Distributions



AGE AND SEX DISTRIBUTIONS
BONNYVILLE: 1966 AND 1971

□ 1966
▨ 1971

Figure 3.8 Age and Sex Distributions

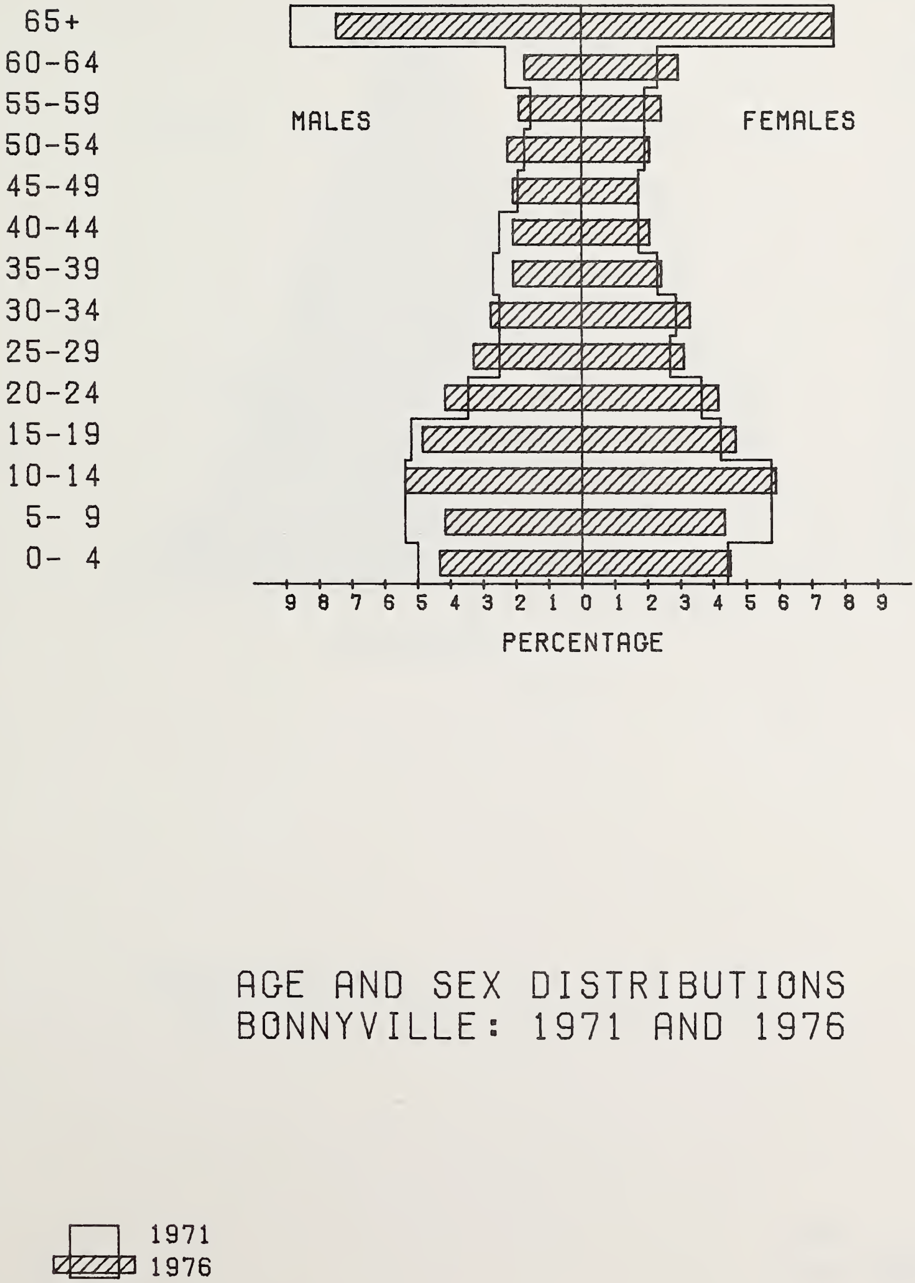
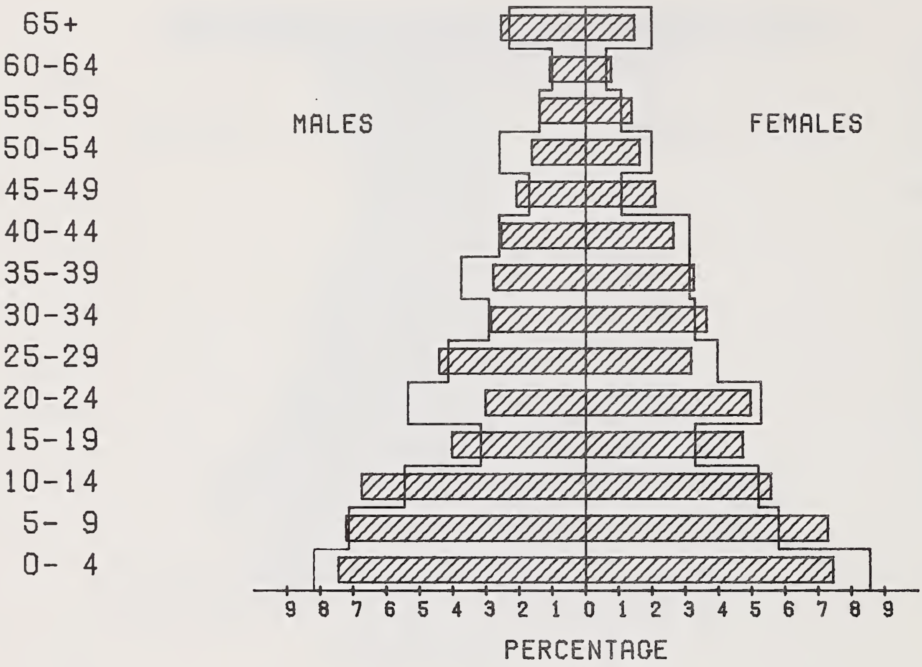


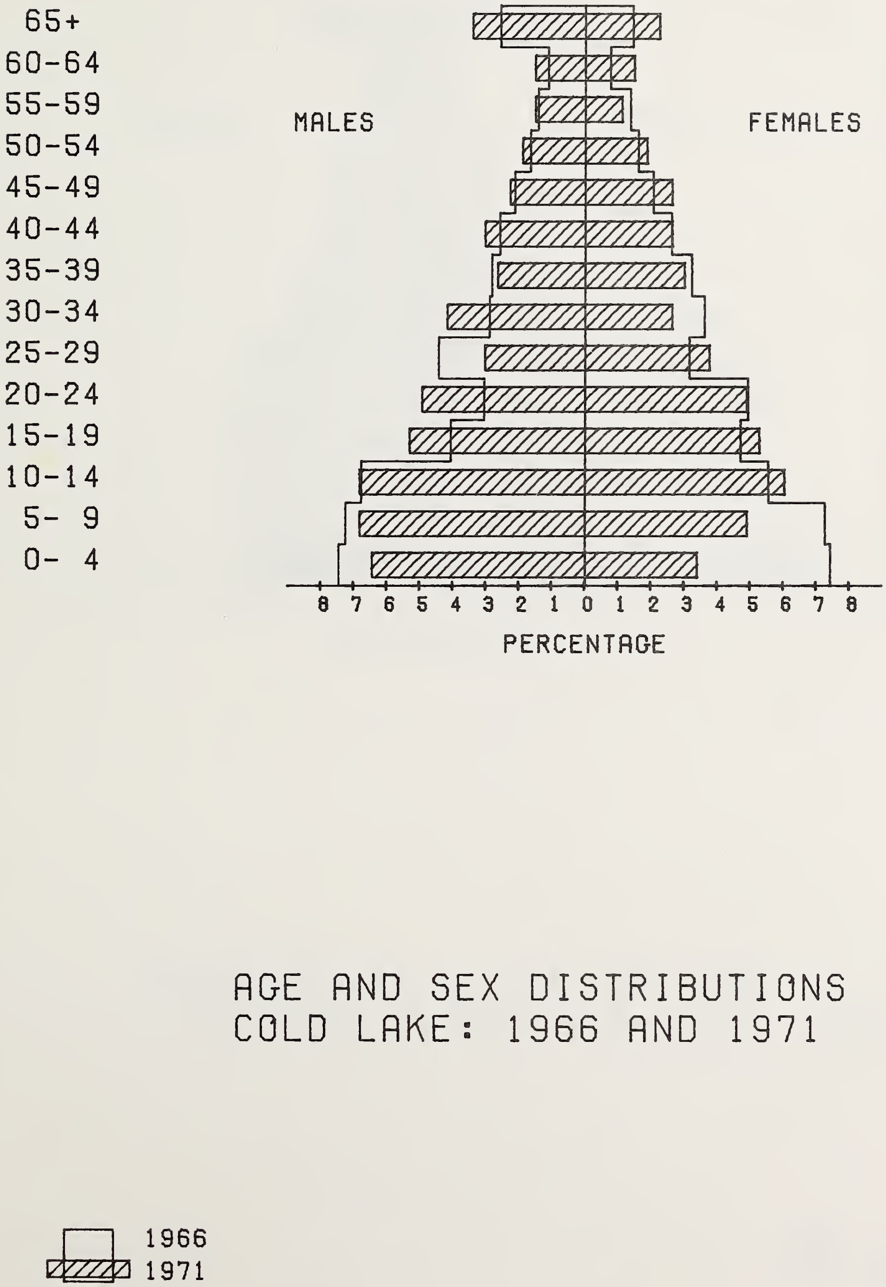
Figure 3.9 Age and Sex Distributions



AGE AND SEX DISTRIBUTIONS
COLD LAKE: 1961 AND 1966

□ 1961
▨ 1966

Figure 3.10 Age and Sex Distributions



AGE AND SEX DISTRIBUTIONS
COLD LAKE: 1966 AND 1971

Figure 3.11 Age and Sex Distributions

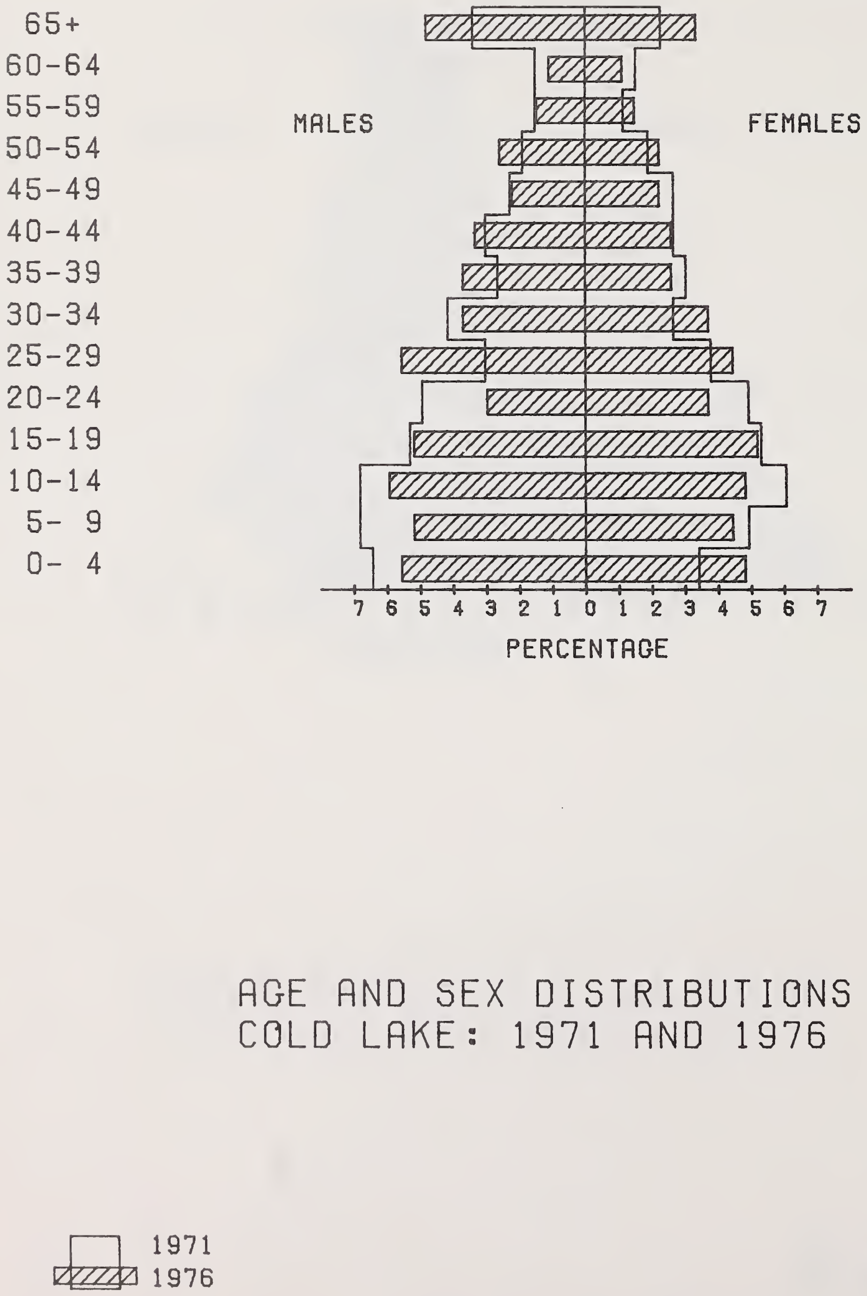


Figure 3.12 Age and Sex Distributions

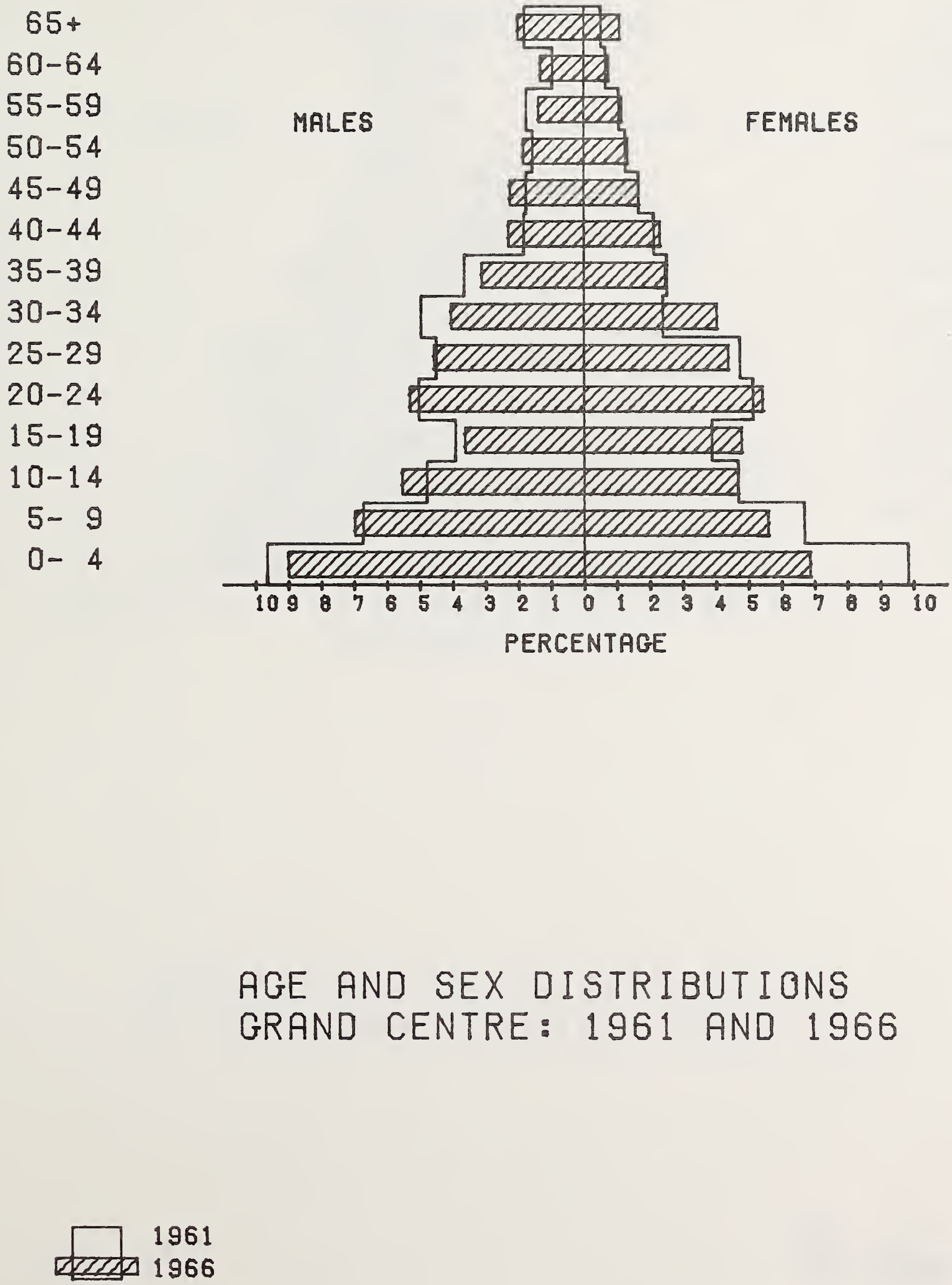
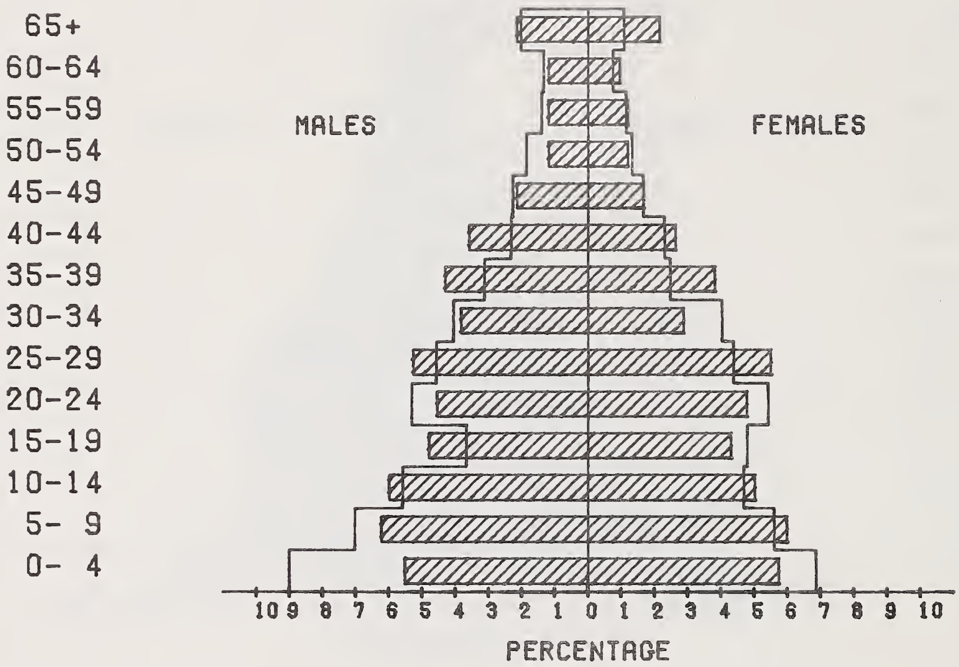


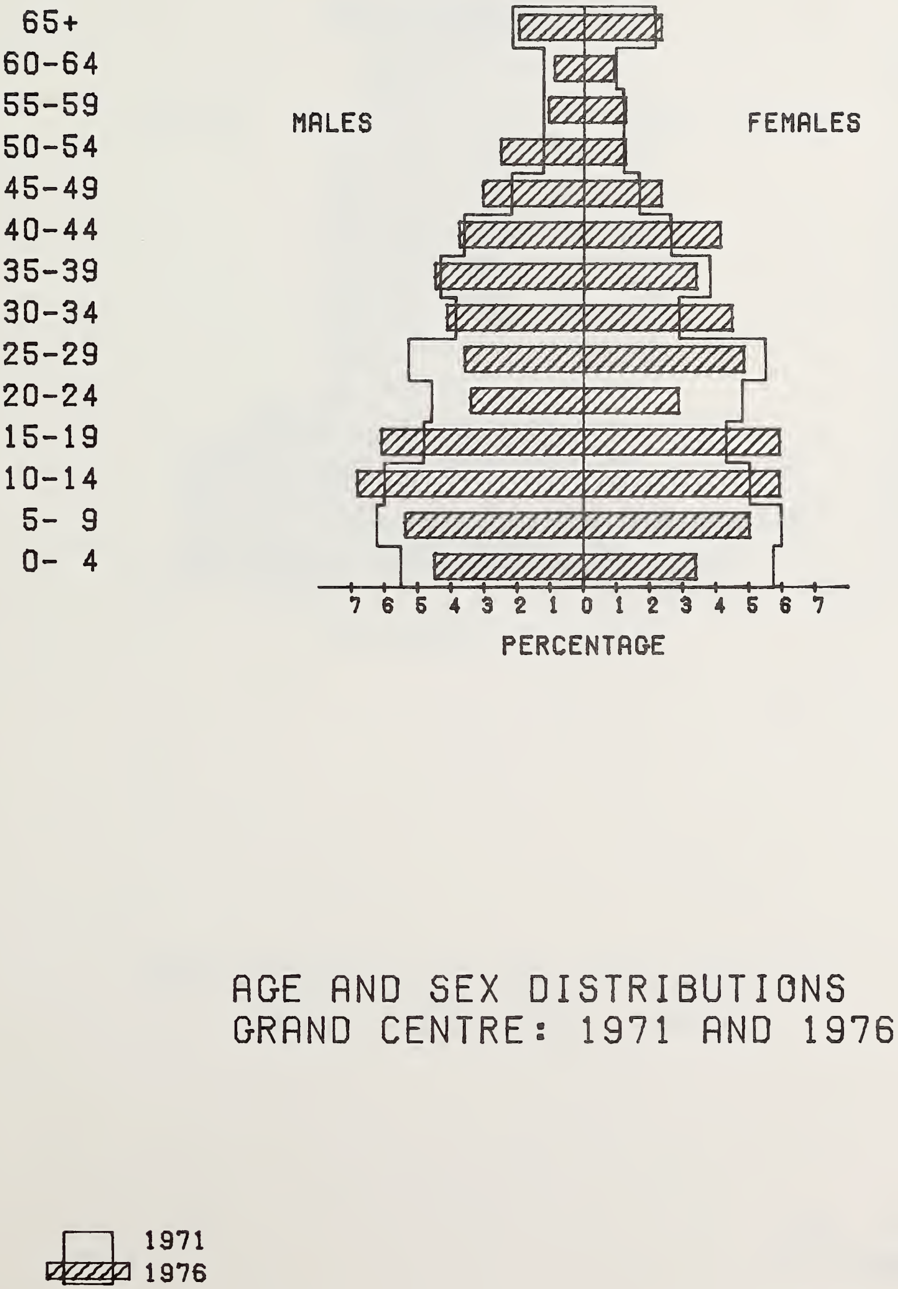
Figure 3.13 Age and Sex Distributions



AGE AND SEX DISTRIBUTIONS
GRAND CENTRE: 1966 AND 1971

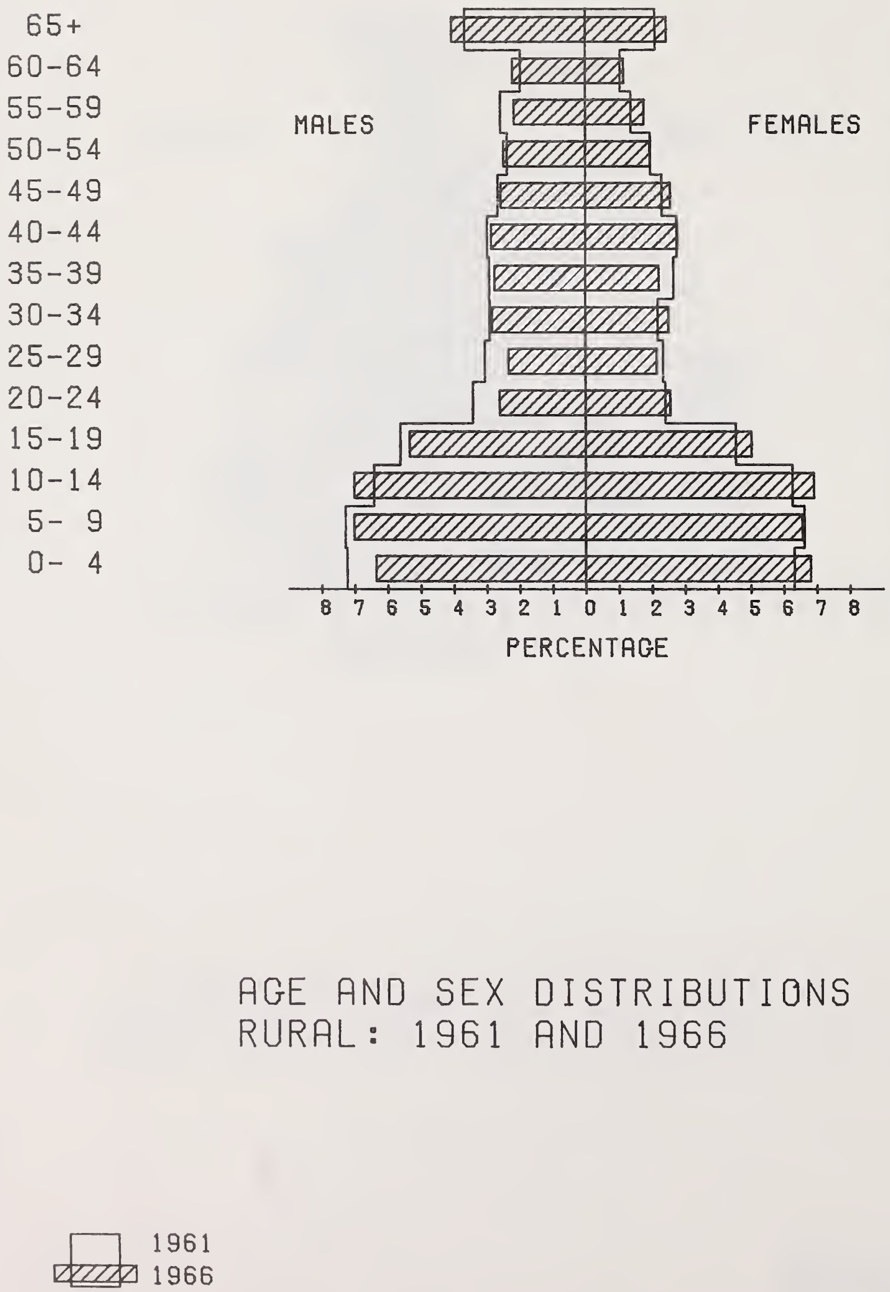
▭ 1966
▨ 1971

Figure 3.14 Age and Sex Distributions



AGE AND SEX DISTRIBUTIONS
GRAND CENTRE: 1971 AND 1976

Figure 3.15 Age and Sex Distributions



AGE AND SEX DISTRIBUTIONS
RURAL: 1961 AND 1966

Figure 3.16 Age and Sex Distributions

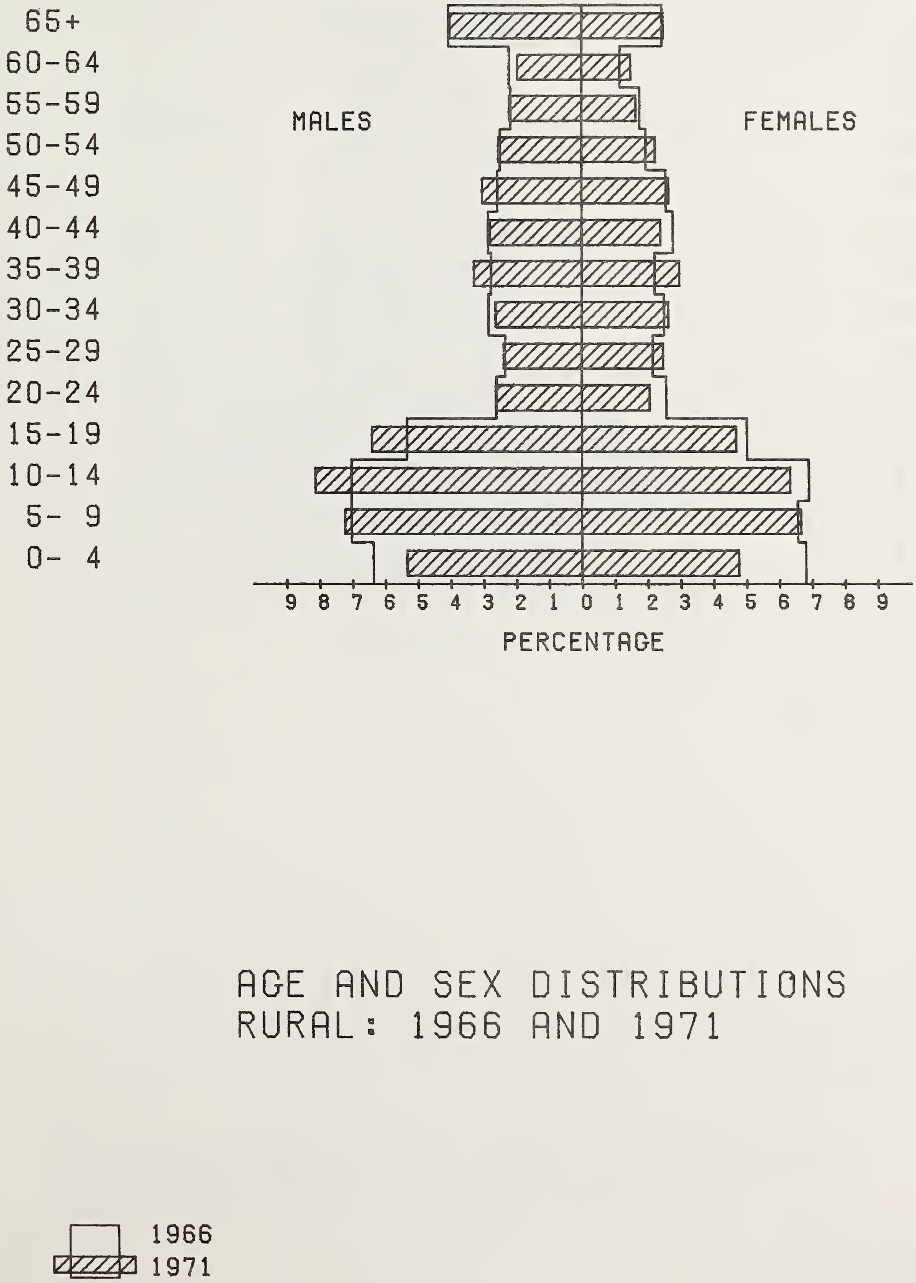
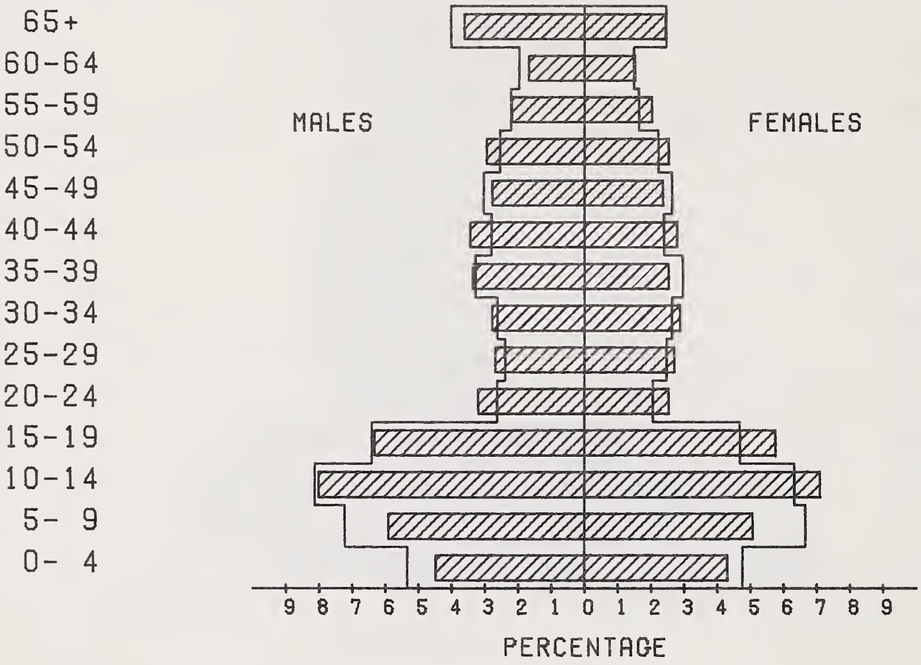


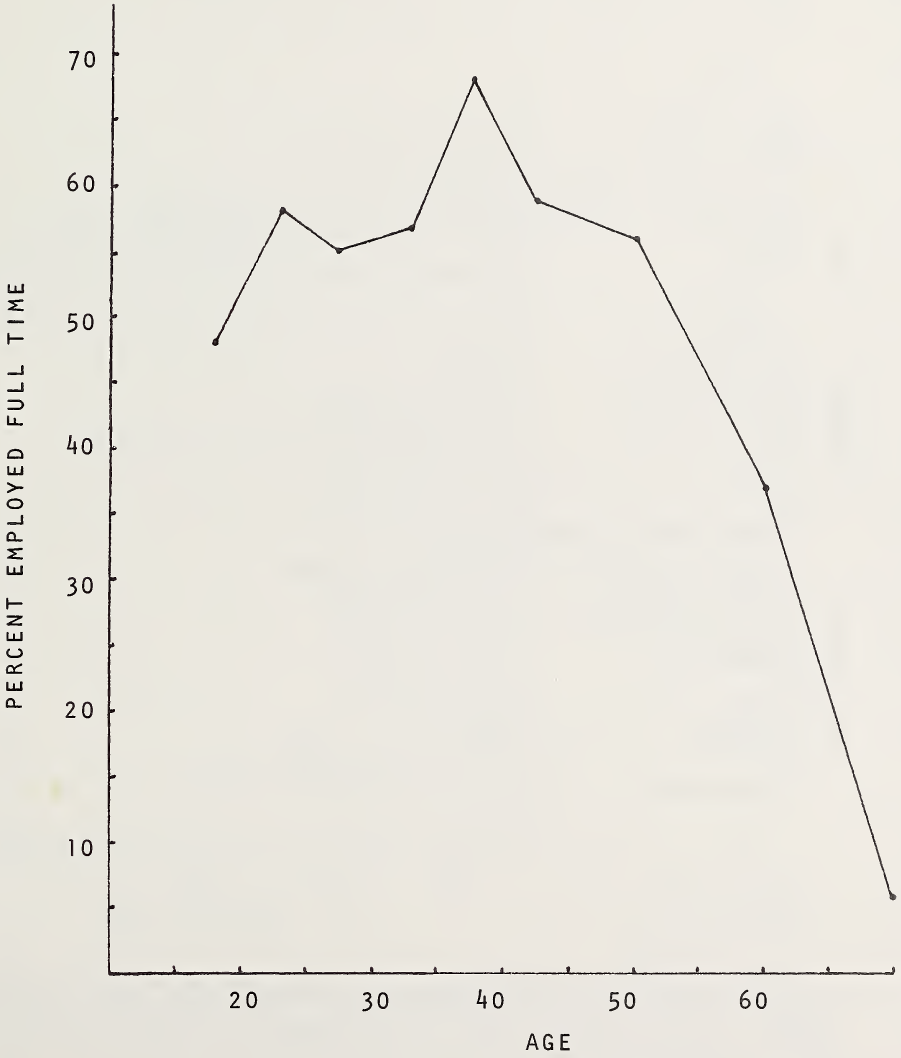
Figure 3.17 Age and Sex Distributions



AGE AND SEX DISTRIBUTIONS
RURAL: 1971 AND 1976

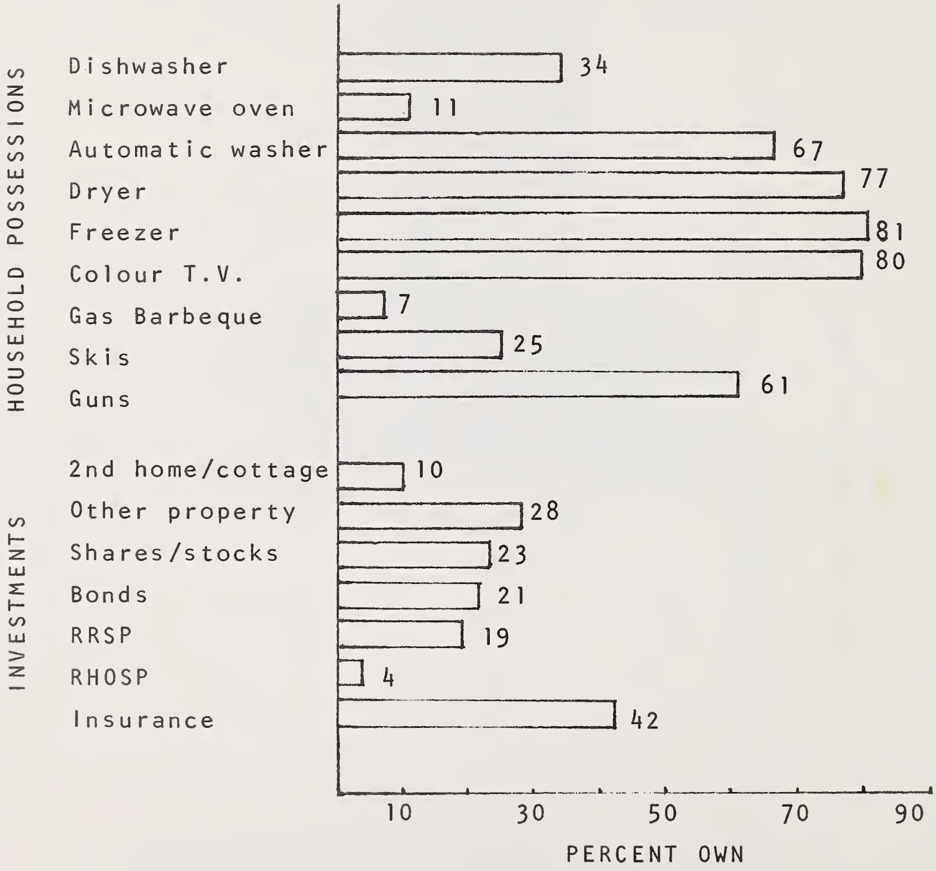
☐ 1971
▨ 1976

Figure 5.1 Labour Force Participation by Age[1]



[1] Sub-sample sizes are: ≤21 years (66); 22-25 (102); 26-30 (108); 31-35 (111); 36-40 (86); 41-45 (92); 46-55 (148); 56-65 (102); ≥66 (123).

Figure 5.3 Household Possessions and Investments[1]



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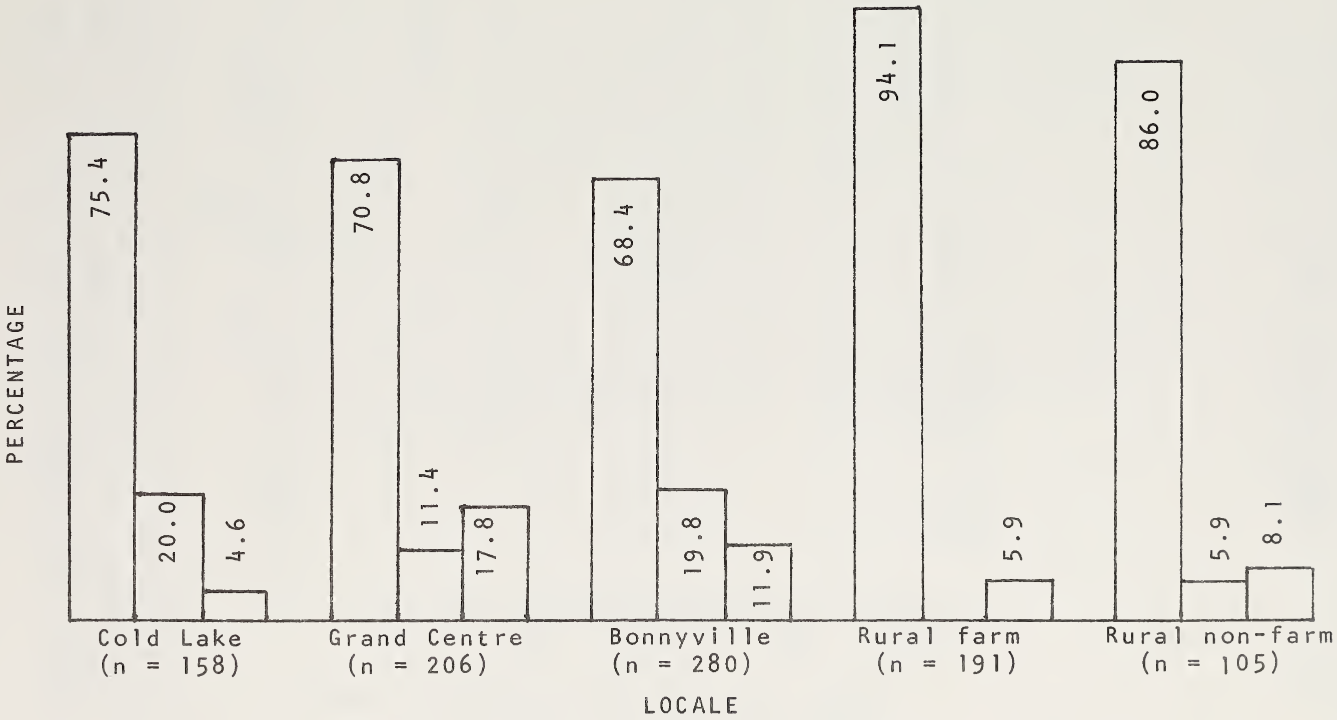
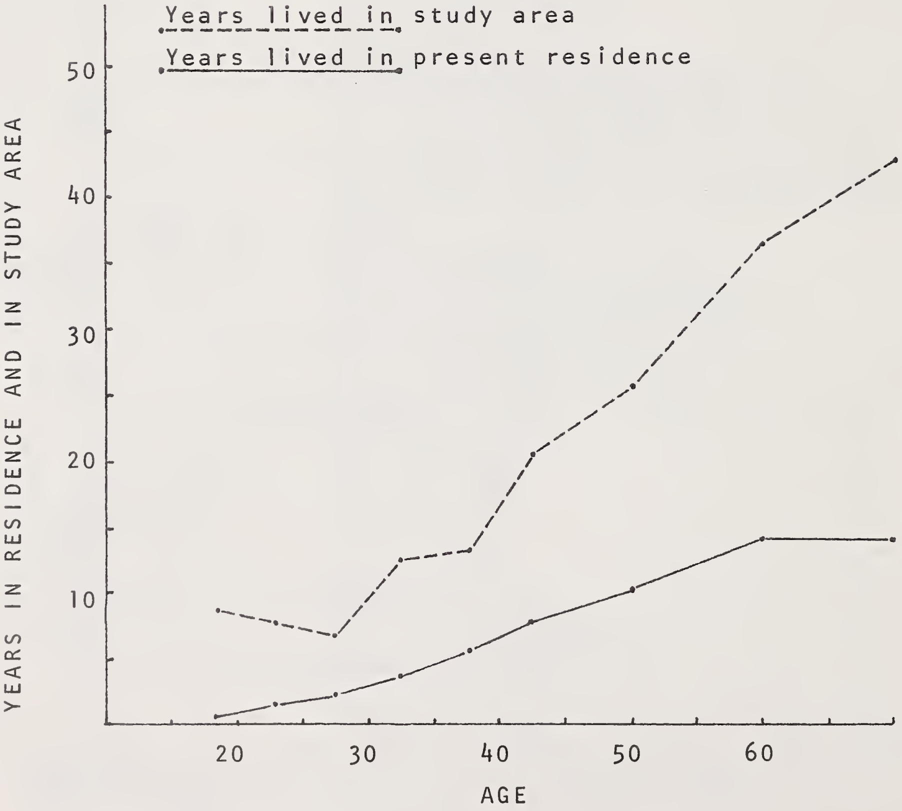
[1] Sample sizes are 940 except for RRSP (936) and Insurance (938). Respondents were instructed to answer "Yes" for RRSP, RHOSP and insurance only if they personally had these investments.

Figure 6.1 House Type[1] by Locale



[1] In each locale, the left column represents single dwellings, the centre column is for dwellings in multiple-unit structures, and the right column represents mobile homes.

Figure 6.2 Years Lived in Study Area and in Present Residence by Age[1]



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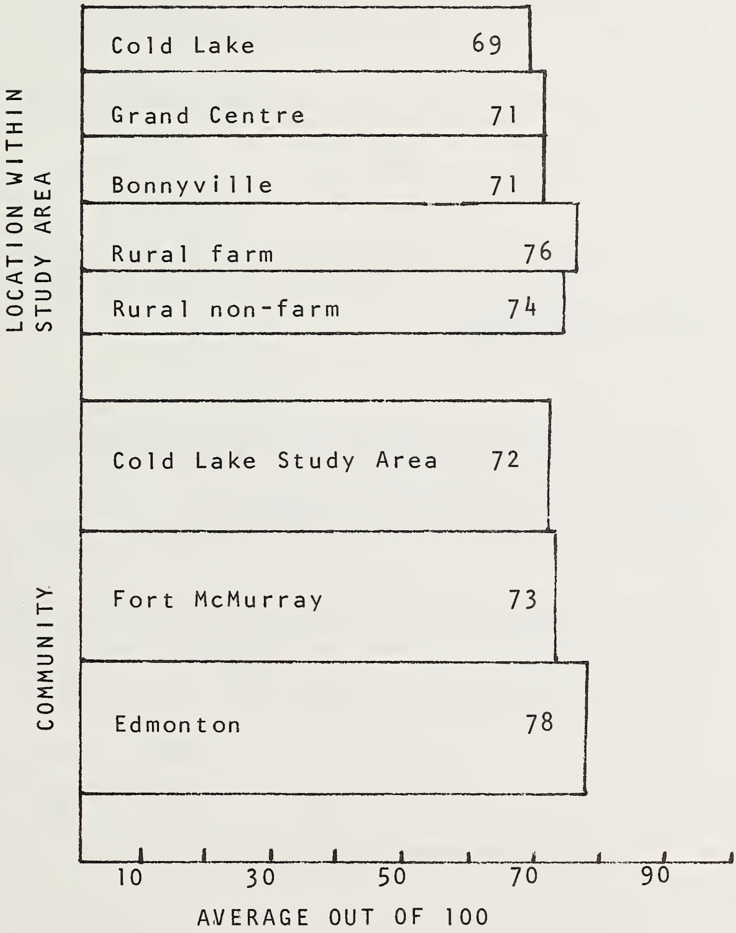
[1] Sub-sample sizes are: 21 years (66); 22-25 (102); 26-30 (108); 31-35 (109); 36-40 (86); 41-45 (91); 46-55 (147); 56-65 (102); 66 (123).

Figure 8.1 Satisfaction with Non-work Activities:[1] Cold Lake Study Area and Component Parts, Fort McMurray[2] and Edmonton[3]



[1] Original seven point scale ("very dissatisfied" to "very satisfied") transformed into a zero to one hundred scale.

[2] Source: Gartrell et al.,1980.

[3] Source: Edmonton Area Study 1979, Population Research Laboratory, University of Alberta.

Figure 10.1 Levels of Associational Affiliation by Area

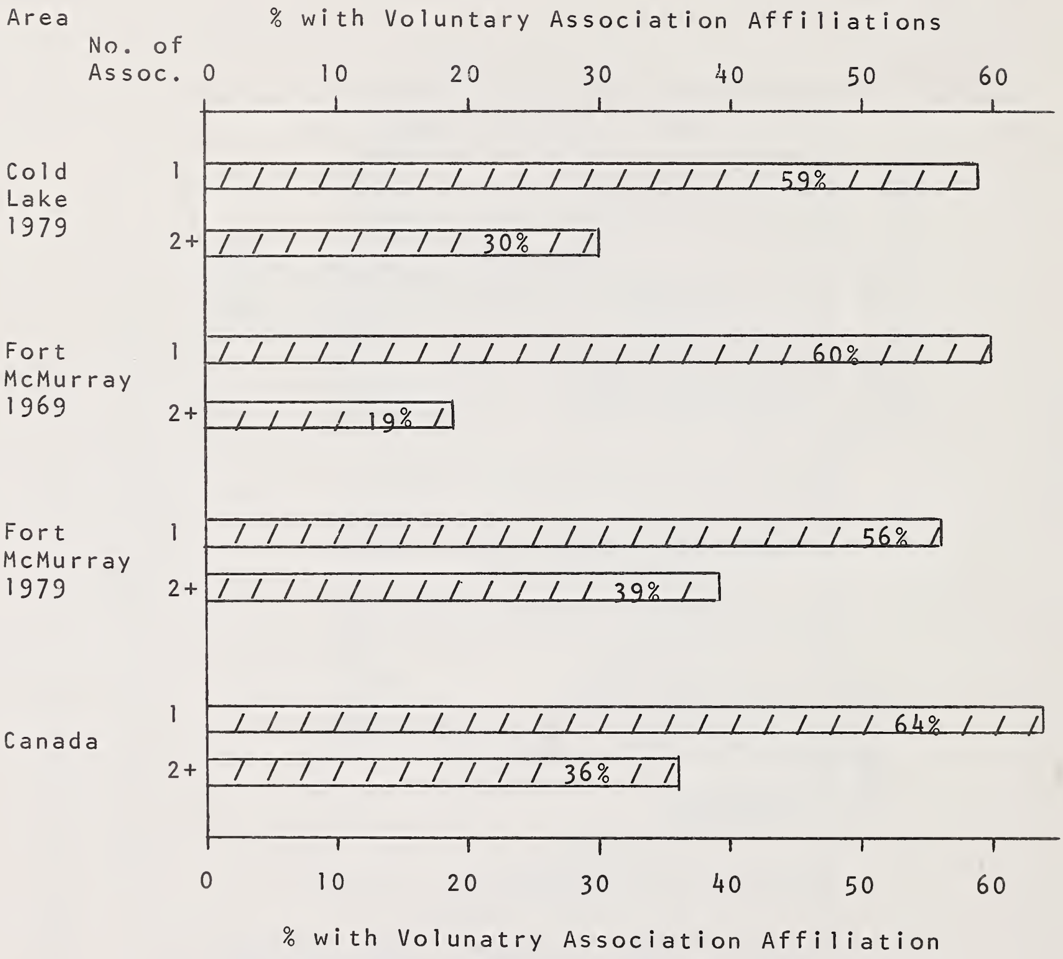


Figure 10.3 Knowing Neighbours: Age Cohort Comparisons

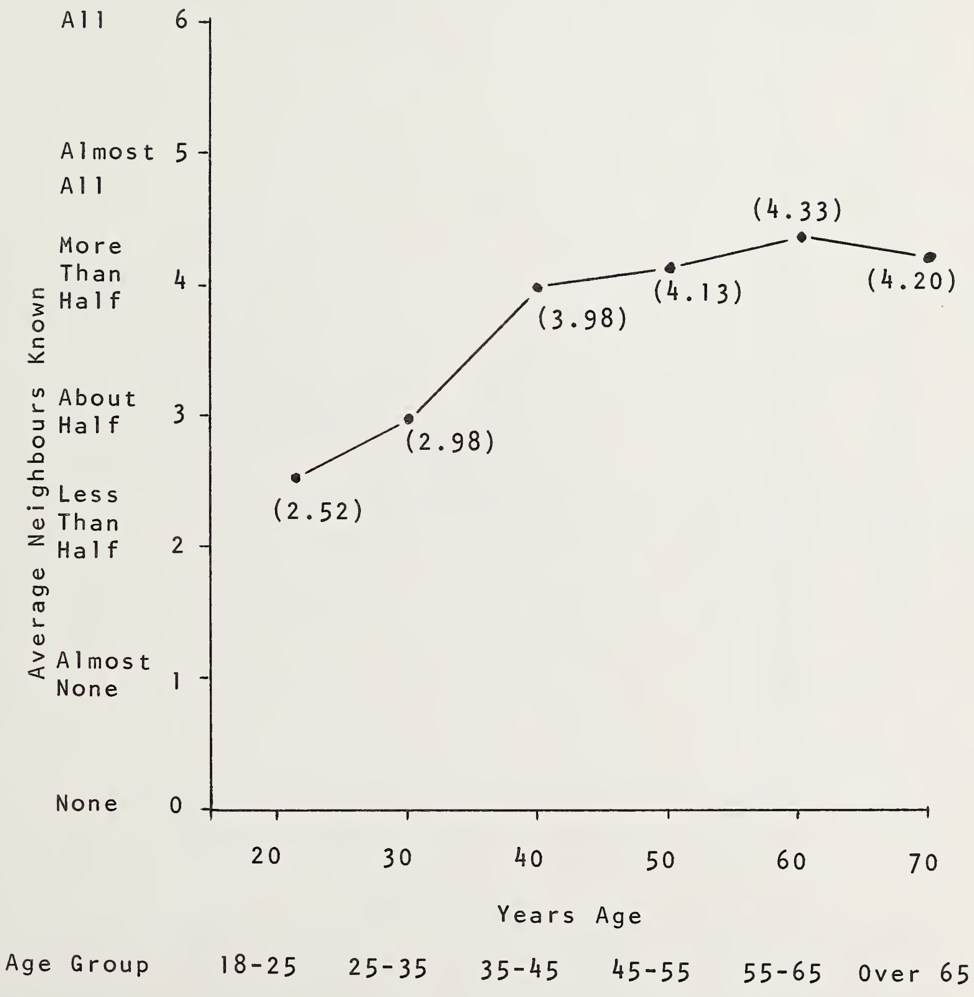
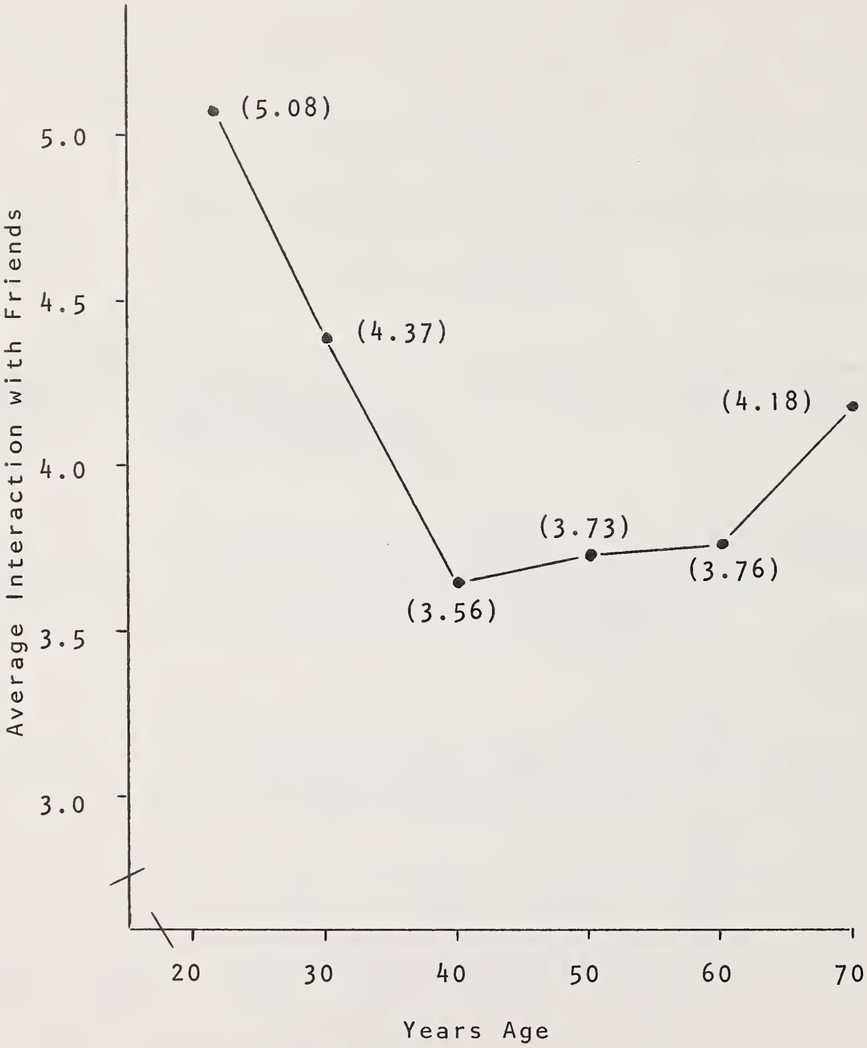


Figure 10.4 Age and Visiting with Friends[1]



N	140	227	176	152	106	139
Age Group	18-25	25-35	35-45	45-55	55-65	Over 65

[1] The value of 3.0 on the interaction scale represents "once a month"; 4.0 represents "several times a month", and 5.0 represents "once a week".

Table 2.1 Outcome of Interview by Area of Study

Locale	Total N. COL.1	N. of Contacts COL. 2	Comp. Interviews	Comp. Inter. As % Col. 1	Comp. Inter. As % Col. 2	Refusal	Ref. As % Col. 1	Ref. As % Col. 2	No Cont.	No Cont. As % Col. 1	Other/ % Col. 1
Cold Lake	159	155	130	81.8	83.9	22	13.8	14.2	4	2.5	3/1.9
Grand Centre	237	235	202	85.2	86.0	33	13.9	14.4	2	1.0	0/0
CFB	352	341	297	84.4	87.1	42	11.9	12.3	11	3.1	2/0.6
Village	89	79	64	71.9	81.0	8	9.0	10.1	10	11.2	7/7.9
Bonnyville	221	212	177	80.1	83.4	34	15.4	16.0	9	4.1	1/0
Rural	261	235	205	78.5	87.2	18	6.9	7.6	26	10.0	12/4.6
TOTAL	1,319	1,257	1,075	81.5	85.5	157	11.9	12.5	62	4.7	25/1.9

Table 3.1 Population Trends, Alberta and Canada: 1901-1981.

Census Year	Canada		Alberta	
	Population	Change	Population	Change
1981	24,338,200[1]	12.8%	2,155,200[2]	32.4%
1971	21,568,315	18.3	1,627,875	22.2
1961	18,238,247	30.2	1,331,944	41.8
1951	14,009,429	21.8	939,501	18.0
1941	11,506,655	10.9	796,169	8.8
1931	10,376,786	18.1	731,605	24.3
1921	8,787,949	21.9	588,454	57.2
1911	7,206,643	34.2	374,295	412.6
1901	5,371,315	--	73,022	--

[1] 1981 Canada population figure taken from Projection Series 3, Population Projections for Canada and Provinces: 1976-2001, Cat. No. 91-520, Occasional, Statistics Canada, February, 1979. Series 3 assumes fertility will continue to decrease until the total fertility rate reaches 1.7 in 1991 and net international migration is assumed to be 75,000 annually.

[2] 1981 Alberta population figure taken from Projection Series 4, Population Projections Alberta: 1977-2006, Table 2, Alberta Bureau of Statistics, February, 1979.

Sources: 1961 Census of Canada, Historical, 1901-1961, Vol. 1, Part 1, Bulletin 1.1-10, Table 6.
1971 Census of Canada, Population, Census Subdivisions (Historical), Vol. 1, Part 1, (Bulletin 1.1-2, Table 1.

Table 3.2 Quinquinnial Population Change, Alberta: 1901 - 1976.

Census Year	Population	Population Change #	%
1976	1,838,040	210,166	12.9
1971	1,627,874	164,671	11.3
1966	1,463,203	131,259	9.8
1961	1,331,944	208,828	18.6
1956	1,123,116	183,615	19.5
1951	939,501	136,171	17.0
1946	803,330	7,161	0.9
1941	796,169	23,387	3.0
1936	772,782	41,177	5.6
1931	731,605	124,006	20.4
1926	607,599	19,145	3.3
1921	588,454	92,012	18.5
1916	496,442	122,147	32.6
1911	374,295	189,100	102.1
1906	185,195	112,173	153.6
1901	73,022	---	---

Source: 1976 Census of Canada, Population: Geographic Distributions, Bulletin 1.6. Table 3.
1971 Census of Canada, Population, Census Subdivisions, [Historical], Bulletin 1.1-2.
1946 Census of the Prairie Provinces, Vol. 1, Table 19.
1936 Census of the Prairie Provinces, Vol. 1, Table 1.
1931 Census of the Prairie Provinces, Vol. 1, Table 23.

Table 3.3 Comparability of Census Enumeration Areas with Cold Lake Study Area Component Parts for 1961, 1966, 1971, and 1976.

Study Area Components	Enumeration Area Codes			
	1961	1966	1971	1976
Electoral District	[802]	[802]	[801]	[801]
Bonnyville	134	65-67	63-66	21-24
Cold Lake	135	116-117, 125	16-17	61-62
Grand Centre	136	118-120	18-20	63-66
Rural MD 87	29-30, 32-51, 55, 140, 142	51-64, 68-69, 101-109, 130	11-12, 15, 51-62, 67-68, 108, and [818] 467-468	10-11, 13-20, 25, 51, 58-60, 67, 69, and [818] 267-268

Sources: Enumeration field maps, verbal descriptions, and comparability listings for the 1961, 1966, 1971, and 1976 Censuses of Canada.

Table 3.5 Population Trends by Life Cycle Stages, Cold Lake Study Area and Component Parts: 1961 - 1976. [Continued]

Life Cycle Stages	Rural MD 87				Total Study Area[1]				Alberta			
	1961	1966	1971	1976	1961	1966	1971	1976	1961	1966	1971	1976
						Number						
0 - 14	2900	2679	2340	2065	4689	4727	4340	4170	469324	510766	514510	503130
15 - 24	1156	1023	960	1055	1912	1893	2045	2310	188158	231004	303150	379220
25 - 44	1577	1347	1310	1375	2722	2642	2820	3300	365194	371213	411825	499820
45 - 64	1177	1111	1080	1070	1725	1775	1895	2130	216190	246210	279645	317945
65 and over	417	429	395	360	715	809	990	1025	93078	104010	118745	137925
All Ages	7227	6589	6085	5925	11763	11846	12090	12935	1331944	1463203	1627875	1838040
						Percent						
0 - 14	40.1	40.7	38.5	34.8	39.8	39.9	35.9	32.2	35.2	34.9	31.6	27.4
15 - 24	16.0	15.5	15.8	17.8	16.3	16.0	16.9	17.9	14.1	15.8	18.6	20.6
25 - 44	21.8	20.4	21.5	23.2	23.1	22.3	23.3	25.5	27.4	25.4	25.3	27.2
45 - 64	16.3	16.9	17.7	18.1	14.7	15.0	15.7	16.5	16.2	16.8	17.2	17.3
65 and over	5.8	6.5	6.5	6.1	6.1	6.8	8.2	7.9	7.0	7.1	7.3	7.5
All Ages	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

---

[1] Excludes Cold Lake Canadian Forces Base and Indian Reserves.

Source: Statistics generated from data made available in Census of Canada enumeration area tabulations.

Table 3.6 Effective Fertility Ratios and Percentage Change, Cold Lake Study Area and Component Parts: 1961 - 1976.

Area	Effective Fertility Ratios			
	1961	1966	1971	1976
Alberta	66.5	58.1	43.2	35.6
Total Study Area[1]	80.1	74.4	53.4	41.5
Bonnyville	72.0	81.0	53.4	44.7
Cold Lake	75.8	66.4	44.1	46.7
Grand Centre	93.3	67.7	47.0	30.1
Rural MD 87	80.0	76.4	58.9	45.8

	Percentage Change		
	1961-1966	1966-1971	1971-1976
Alberta	-12.6	-25.6	-17.6
Total Study Area[1]	- 7.1	-28.2	-22.3
Bonnyville	+12.5	-33.6	-16.9
Cold Lake	-12.4	-33.6	+ 5.9
Grand Centre	-27.4	-30.6	-36.0
Rural MD 87	- 4.5	-27.6	-22.2

[1] Excludes Cold Lake Canadian Forces Base and Indian Reserves.

Source: Statistics generated from data made available in Census of Canada enumeration area tabulations.

Table 3.9 Migration Status of the Population and Percentage Change, Cold Lake Study Area and Component Parts: 1971 and 1976.

Area	1971		1976		1971-1976 Percent Change[a]
	#	%[b]	#	%[b]	
Total Study Area[1]					
Migrants	3,155	71.7	3,580	71.7	+13.5
Non-Migrants	8,005	28.3	9,080	28.3	+13.4
Bonnyville					
Migrants	710	28.7	855	39.0	+20.4
Non-Migrants	1,760	71.3	1,780	67.5	+ 1.1
Cold Lake					
Migrants	465	38.0	470	39.0	+ 1.1
Non-Migrants	760	62.0	735	61.0	- 3.3
Grand Centre					
Migrants	985	49.9	1,245	51.6	+26.4
Non-Migrants	990	50.1	1,170	48.4	+18.2
Rural MD 87					
Migrants	995	18.1	1,010	15.8	+ 1.5
Non-Migrants	4,495	81.9	5,395	84.2	+20.0

[1] Excludes Cold Lake Canadian Forces Base and Indian Reserves.

[a] Percentage change between 1971 and 1976 in the number of migration participants.

[b] Migration rate is the percentage of the total population, five years of age and over.

Source: Statistics generated from data made available in Census of Canada enumeration area tabulations.

Table 3.10 Marital Status of the Population, Cold Lake Study Area and Component Parts: 1961 - 1976.

Area and Marital Status	1961		1966		1971		1976	
	#	%	#	%	#	%	#	%
Total Study Area[1]								
single	2,003	28.3	1,867	26.2	2,055	26.5	2,210	25.3
married	4,750	67.2	4,897	68.8	5,245	67.6	6,000	68.7
divorced	17	0.2	23	0.3	60	0.8	125	1.4
widowed	304	4.3	334	4.7	400	5.1	400	4.6
Bonnyville								
single	304	27.5	352	25.2	435	24.6	450	22.0
married	712	64.4	936	67.0	1,155	65.3	1,410	68.8
divorced	1	0.1	2	0.1	20	1.1	25	1.2
widowed	89	8.0	107	7.7	160	9.0	165	8.0
Cold Lake								
single	194	24.9	176	23.4	220	26.7	235	25.8
married	546	70.0	551	73.4	580	70.3	605	66.5
divorced	5	0.6	4	0.5	5	0.6	25	2.7
widowed	35	4.5	20	2.7	20	2.4	45	5.0
Grand Centre								
single	179	20.8	182	17.1	290	20.6	465	24.2
married	655	76.0	843	79.4	1,045	74.4	1,350	70.3
divorced	5	0.6	10	0.9	20	1.4	50	2.6
widowed	22	2.6	28	2.6	50	3.6	55	2.9
Rural MD 87								
single	1,326	30.6	1,157	29.6	1,110	29.5	1,060	27.5
married	2,837	65.6	2,567	65.7	2,465	65.6	2,635	68.4
divorced	6	0.1	7	0.2	15	0.4	25	0.6
widowed	158	3.7	179	4.5	170	4.5	135	3.5

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[1] Excludes Cold Lake Canadian Forces Base and Indian Reserves.

Source: Statistics generated from data made available in Census of Canada enumeration area tabulations.

Table 3.11 Age and Sex Composition by Five Year Age Groups, Alberta: 1961.

Age Group	Males		Females	
	#	%	#	%
All Ages	689,383	51.8	642,561	48.2
0 - 4	92,250	7.1	87,638	6.4
5 - 9	81,633	6.1	77,420	5.8
10 - 14	66,680	5.0	63,703	4.8
15 - 19	50,296	3.8	48,708	3.7
20 - 24	44,403	3.3	44,751	3.4
25 - 29	49,720	3.7	46,010	3.5
30 - 34	50,694	3.8	46,147	3.5
35 - 39	46,305	3.5	45,388	3.4
40 - 44	41,288	3.1	39,642	3.0
45 - 49	36,342	2.7	33,932	2.5
50 - 54	30,870	2.3	27,403	2.1
55 - 59	26,870	2.0	21,947	1.6
60 - 64	21,182	1.6	17,644	1.3
65 and over	50,850	3.8	42,228	3.2

Source: *1961 Census of Canada*, Census Summary Tapes.

Table 3.12 Age and Sex Composition by Five Year Age Groups, Alberta: 1966.

Age Group	Males		Females	
	#	%	#	%
All Ages	746,245	51.0	716,958	49.0
0 - 4	89,078	6.1	84,490	5.8
5 - 9	91,627	6.2	87,913	6.1
10 - 14	81,038	5.5	76,620	5.2
15 - 19	64,826	4.4	64,173	4.4
20 - 24	49,933	3.4	52,072	3.6
25 - 29	45,737	3.1	46,463	3.2
30 - 34	48,767	3.3	45,714	3.1
35 - 39	49,421	3.4	46,075	3.1
40 - 44	44,701	3.1	44,335	3.0
45 - 49	39,476	2.7	38,409	2.6
50 - 54	34,454	2.4	32,885	2.2
55 - 59	28,727	2.0	26,538	1.8
60 - 64	24,366	1.7	21,355	1.5
65 and over	54,094	3.7	49,916	3.4

Source: 1966 Census of Canada, Census Summary Tapes.

Table 3.13 Age and Sex Composition by Five Year Age Groups, Alberta: 1971.

Age Group	Males		Females	
	#	%	#	%
All Ages	827,775	50.9	800,085	49.1
0 - 4	77,610	4.8	74,015	4.5
5 - 9	92,085	5.7	88,670	5.4
10 - 14	93,410	5.8	88,720	5.5
15 - 19	81,970	5.0	78,920	4.8
20 - 24	70,575	4.3	71,685	4.4
25 - 29	59,845	3.7	58,880	3.6
30 - 34	50,785	3.1	49,150	3.0
35 - 39	51,320	3.2	46,905	2.9
40 - 44	49,535	3.0	45,400	2.8
45 - 49	44,260	2.7	43,790	2.7
50 - 54	37,490	2.3	37,030	2.3
55 - 59	32,930	2.0	32,225	2.0
60 - 64	26,485	1.6	25,435	1.6
65 and over	59,475	3.7	59,260	3.6

Source: _1971 Census of Canada_, Census Summary Tapes.

Table 3.14 Age and Sex Composition by Five Year Age Groups, Alberta: 1976.

Age Group	Males		Females	
	#	%	#	%
All Ages	932,370	50.7	905,665	49.3
0 - 4	78,375	4.3	74,550	4.1
5 - 9	83,505	4.5	79,490	4.3
10 - 14	95,565	5.2	91,645	5.0
15 - 19	98,960	5.3	94,255	5.2
20 - 24	94,580	5.1	91,425	5.0
25 - 29	84,320	4.6	80,865	4.4
30 - 34	65,720	3.6	63,095	3.4
35 - 39	53,610	2.9	51,655	2.8
40 - 44	52,405	2.9	48,150	2.6
45 - 49	49,655	2.7	46,120	2.5
50 - 54	43,535	2.4	44,080	2.4
55 - 59	36,145	2.0	36,785	2.0
60 - 64	30,250	1.6	31,370	1.7
65 and over	65,745	3.6	72,180	3.9

Source: 1976 Census of Canada, Census Summary Tapes.

Table 3.15 Age and Sex Composition by Five Year Age Groups, Cold Lake Study Area: 1961.

Age Group	Males		Females	
	#	%	#	%
All Ages	6,312	53.7	5,451	46.3
0 - 4	908	7.8	825	7.1
5 - 9	835	7.1	765	6.5
10 - 14	683	5.8	673	5.7
15 - 19	576	4.9	496	4.2
20 - 24	446	3.8	394	3.3
25 - 29	397	3.4	350	3.0
30 - 34	372	3.2	292	2.5
35 - 39	361	3.1	315	2.7
40 - 44	319	2.7	316	2.7
45 - 49	268	2.3	239	2.0
50 - 54	263	2.2	217	1.8
55 - 59	252	2.1	154	1.3
60 - 64	193	1.6	139	1.2
65 and over	439	3.7	276	2.3

Source: 1961 Census of Canada, Enumeration Area Tabulations and Alberta Bureau of Statistics.

Table 3.16 Age and Sex Composition by Five Year Age Groups, Cold Lake Study Area: 1966.

Age Group	Males		Females	
	#	%	#	%
All Ages	6,176	52.1	5,670	47.9
0 - 4	834	7.0	832	6.9
5 - 9	830	7.0	754	6.4
10 - 14	771	6.5	706	6.0
15 - 19	554	4.7	562	4.7
20 - 24	368	3.1	409	3.5
25 - 29	357	3.0	347	2.9
30 - 34	376	3.2	339	2.9
35 - 39	328	2.8	280	2.4
40 - 44	312	2.6	303	2.6
45 - 49	279	2.4	266	2.2
50 - 54	250	2.1	209	1.8
55 - 59	221	1.9	193	1.6
60 - 64	219	1.8	138	1.2
65 and over	477	4.0	332	2.8

Source: 1966 Census of Canada, Enumeration Area Tabulations and Alberta Bureau of Statistics.

Table 3.17 Age and Sex Composition by Five Year Age Groups, Cold Lake Study Area: 1971.

Age Group	Males		Females	
	#	%	#	%
All Ages	6,445	53.3	5,645	46.7
0 - 4	655	5.4	570	4.7
5 - 9	800	6.6	745	6.1
10 - 14	850	6.9	720	6.0
15 - 19	695	5.7	555	4.6
20 - 24	410	3.4	385	3.2
25 - 29	360	3.0	385	3.2
30 - 34	360	3.0	330	2.7
35 - 39	395	3.3	360	3.0
40 - 44	350	2.9	280	2.3
45 - 49	310	2.6	275	2.3
50 - 54	250	2.1	235	1.9
55 - 59	220	1.8	190	1.6
60 - 64	225	1.9	190	1.6
65 and over	565	4.7	425	3.5

Source: 1971 Census of Canada, Enumeration Area Tabulations and Alberta Bureau of Statistics.

Table 3.18 Age and Sex Composition by Five Year Age Groups, Cold Lake Study Area: 1976.

Age Group	Males		Females	
	#	%	#	%
All Ages	6,730	52.0	6,205	48.0
0 - 4	590	4.6	545	4.2
5 - 9	690	5.3	625	4.8
10 - 14	900	6.9	820	6.4
15 - 19	755	5.8	710	5.5
20 - 24	445	3.4	400	3.1
25 - 29	430	3.3	445	3.4
30 - 34	410	3.2	440	3.4
35 - 39	435	3.4	350	2.7
40 - 44	415	3.2	375	2.9
45 - 49	340	2.6	285	2.2
50 - 54	345	2.7	275	2.1
55 - 59	235	1.8	245	1.9
60 - 64	190	1.5	215	1.7
65 and over	550	4.3	475	3.7

Source: 1976 Census of Canada, Enumeration Area Tabulations and Alberta Bureau of Statistics.

Table 3.19 Age and Sex Composition by Five Year Age Groups, Bonnyville: 1961.

Age Group	Males		Females	
	#	%	#	%
All Ages	869	50.1	867	49.9
0 - 4	134	7.7	110	6.3
5 - 9	115	6.6	111	6.4
10 - 14	77	4.4	83	4.8
15 - 19	71	4.1	66	3.8
20 - 24	54	3.1	74	4.3
25 - 29	56	3.2	57	3.3
30 - 34	50	2.9	55	3.2
35 - 39	47	2.7	44	2.5
40 - 44	42	2.4	43	2.5
45 - 49	28	1.6	33	1.9
50 - 54	34	2.0	30	1.7
55 - 59	21	1.2	25	1.4
60 - 64	23	1.3	46	2.6
65 and over	117	6.7	90	5.2

Source: 1961 Census of Canada, Enumeration Area Tabulations.

Table 3.20 Age and Sex Composition by Five Year Age Groups, Bonnyville: 1966.

Age Group	Males		Females	
	#	%	#	%
All Ages	1,139	50.9	1,098	49.1
0 - 4	163	7.3	169	7.6
5 - 9	153	6.8	131	5.9
10 - 14	125	5.6	99	4.4
15 - 19	87	3.9	88	3.9
20 - 24	65	2.9	82	3.7
25 - 29	67	3.0	88	3.9
30 - 34	82	3.7	57	2.5
35 - 39	56	2.5	49	2.2
40 - 44	51	2.3	46	2.1
45 - 49	44	2.0	41	1.8
50 - 54	33	1.5	37	1.7
55 - 59	36	1.6	39	1.7
60 - 64	36	1.6	39	1.7
65 and over	141	6.3	133	5.9

Source: 1966 Census of Canada, Enumeration Area Tabulations.

Table 3.21 Age and Sex Composition by Five Year Age Groups, Bonnyville: 1971.

Age Group	Males		Females	
	#	%	#	%
All Ages	1,325	51.0	1,275	49.0
0 - 4	130	5.0	115	4.4
5 - 9	140	5.4	150	5.8
10 - 14	140	5.4	150	5.8
15 - 19	135	5.2	110	4.2
20 - 24	90	3.5	95	3.7
25 - 29	65	2.5	70	2.7
30 - 34	65	2.5	75	2.9
35 - 39	70	2.7	60	2.3
40 - 44	65	2.5	45	1.7
45 - 49	50	1.9	45	1.7
50 - 54	45	1.7	50	1.9
55 - 59	40	1.5	50	1.9
60 - 64	60	2.3	60	2.3
65 and over	230	8.9	200	7.7

Source: 1971 Census of Canada, Enumeration Area Tabulations.

Table 3.22 Age and Sex Composition by Five Year Age Groups, Bonnyville: 1976.

Age Group	Males		Females	
	#	%	#	%
All Ages	1,400	48.6	1,480	51.4
0 - 4	125	4.3	130	4.5
5 - 9	120	4.2	125	4.3
10 - 14	155	5.3	170	5.9
15 - 19	140	4.9	135	4.7
20 - 24	120	4.2	120	4.2
25 - 29	95	3.3	90	3.1
30 - 34	80	2.8	95	3.3
35 - 39	60	2.1	70	2.4
40 - 44	60	2.1	60	2.1
45 - 49	60	2.1	50	1.7
50 - 54	65	2.3	60	2.1
55 - 59	55	1.9	70	2.4
60 - 64	50	1.7	85	3.0
65 and over	215	7.4	220	7.7

Source: 1976 Census of Canada, Enumeration Area Tabulations.

Table 3.23 Age and Sex Composition by Five Year Age Groups, Cold Lake: 1961.

Age Group	Males		Females	
	#	%	#	%
All Ages	674	51.6	633	48.4
0 - 4	107	8.2	112	8.6
5 - 9	93	7.1	76	5.8
10 - 14	71	5.4	68	5.2
15 - 19	41	3.1	43	3.3
20 - 24	70	5.4	69	5.3
25 - 29	54	4.1	52	4.0
30 - 34	38	2.9	43	3.3
35 - 39	49	3.7	41	3.1
40 - 44	34	2.6	41	3.1
45 - 49	22	1.7	14	1.1
50 - 54	34	2.6	26	2.0
55 - 59	18	1.4	14	1.1
60 - 64	13	1.0	8	0.6
65 and over	30	2.3	26	2.0

Source: *1961 Census of Canada*, Enumeration Area Tabulations.

Table 3.24 Age and Sex Composition by Five Year Age Groups, Cold Lake: 1966.

Age Group	Males		Females	
	#	%	#	%
All Ages	643	49.8	646	50.2
0 - 4	96	7.4	96	7.4
5 - 9	93	7.2	94	7.3
10 - 14	87	6.7	72	5.6
15 - 19	52	4.0	61	4.7
20 - 24	39	3.0	64	5.0
25 - 29	57	4.4	41	3.2
30 - 34	37	2.9	47	3.6
35 - 39	36	2.8	42	3.3
40 - 44	33	2.6	34	2.6
45 - 49	27	2.1	27	2.1
50 - 54	21	1.6	21	1.6
55 - 59	18	1.4	18	1.4
60 - 64	14	1.1	10	0.8
65 and over	33	2.6	19	1.5

Source: 1966 Census of Canada, Enumeration Area Tabulations.

Table 3.25 Age and Sex Composition by Five Year Age Groups, Cold Lake: 1971.

Age Group	Males		Females	
	#	%	#	%
All Ages	710	53.8	610	46.2
0 - 4	85	6.4	45	3.4
5 - 9	90	6.8	65	4.9
10 - 14	90	6.8	80	6.1
15 - 19	70	5.3	70	5.3
20 - 24	65	4.9	65	4.9
25 - 29	40	3.0	50	3.8
30 - 34	55	4.2	35	2.7
35 - 39	35	2.7	40	3.0
40 - 44	40	3.0	35	2.7
45 - 49	30	2.3	35	2.7
50 - 54	25	1.9	25	1.9
55 - 59	20	1.5	15	1.1
60 - 64	20	1.5	20	1.5
65 and over	45	3.4	30	2.3

Source: 1971 Census of Canada, Enumeration Area Tabulations.

Table 3.26 Age and Sex Composition by Five Year Age Groups, Cold Lake: 1976.

Age Group	Males		Females	
	#	%	#	%
All Ages	720	53.3	630	46.7
0 - 4	75	5.6	65	4.8
5 - 9	70	5.2	60	4.4
10 - 14	80	5.8	65	4.8
15 - 19	70	5.2	70	5.2
20 - 24	40	3.0	50	3.7
25 - 29	75	5.6	60	4.4
30 - 34	50	3.7	50	3.7
35 - 39	50	3.7	35	2.6
40 - 44	45	3.3	35	2.6
45 - 49	30	2.2	30	2.2
50 - 54	35	2.6	30	2.2
55 - 59	20	1.5	20	1.5
60 - 64	15	1.1	15	1.1
65 and over	65	4.8	45	3.3

Source: *1976 Census of Canada*, Enumeration Area Tabulations.

Table 3.27 Age and Sex Composition by Five Year Age Groups, Grand Centre: 1961.

Age Group	Males		Females	
	#	%	#	%
All Ages	786	52.6	707	47.4
0 - 4	144	9.6	147	9.8
5 - 9	100	6.7	100	6.7
10 - 14	71	4.8	70	4.7
15 - 19	58	3.9	58	3.9
20 - 24	75	5.0	77	5.2
25 - 29	67	4.5	71	4.8
30 - 34	74	5.0	36	2.4
35 - 39	54	3.6	38	2.5
40 - 44	27	1.8	32	2.1
45 - 49	26	1.7	25	1.7
50 - 54	23	1.5	19	1.3
55 - 59	26	1.7	16	1.1
60 - 64	14	0.9	10	0.7
65 and over	27	1.8	8	0.5

Source: 1961 Census of Canada, Enumeration Area Tabulations.

Table 3.28 Age and Sex Composition by Five Year Age Groups, Grand Centre: 1966.

Age Group	Males		Females	
	#	%	#	%
All Ages	924	53.3	807	46.7
0 - 4	156	9.1	119	6.9
5 - 9	121	7.0	97	5.6
10 - 14	96	5.5	81	4.7
15 - 19	63	3.6	83	4.8
20 - 24	92	5.3	94	5.4
25 - 29	79	4.6	76	4.4
30 - 34	70	4.0	70	4.0
35 - 39	54	3.1	43	2.5
40 - 44	40	2.3	40	2.3
45 - 49	39	2.3	29	1.7
50 - 54	32	1.8	23	1.3
55 - 59	24	1.4	20	1.2
60 - 64	23	1.3	13	0.8
65 and over	35	2.0	19	1.1

Source: 1966 Census of Canada, Enumeration Area Tabulations.

Table 3.29 Age and Sex Composition by Five Year Age Groups, Grand Centre: 1971.

Age Group	Males		Females	
	#	%	#	%
All Ages	1,085	52.0	1,000	48.0
0 - 4	115	5.5	120	5.8
5 - 9	130	6.2	125	6.0
10 - 14	125	6.0	105	5.0
15 - 19	100	4.8	90	4.3
20 - 24	95	4.6	100	4.8
25 - 29	110	5.3	115	5.5
30 - 34	80	3.8	60	2.9
35 - 39	90	4.3	80	3.8
40 - 44	75	3.6	55	2.6
45 - 49	45	2.2	35	1.7
50 - 54	25	1.2	25	1.2
55 - 59	25	1.2	25	1.2
60 - 64	25	1.2	20	1.0
65 and over	45	2.2	45	2.2

Source: 1971 Census of Canada, Enumeration Area Tabulations.

Table 3.30 Age and Sex Composition by Five Year Age Groups, Grand Centre: 1976.

Age Group	Males		Females	
	#	%	#	%
All Ages	1,440	51.8	1,340	48.2
0 - 4	125	4.5	95	3.4
5 - 9	150	5.4	140	5.0
10 - 14	190	6.8	165	5.9
15 - 19	170	6.1	165	5.9
20 - 24	95	3.4	80	2.9
25 - 29	100	3.6	135	4.8
30 - 34	115	4.1	125	4.5
35 - 39	125	4.5	95	3.4
40 - 44	105	3.8	115	4.1
45 - 49	85	3.1	65	2.3
50 - 54	70	2.5	35	1.3
55 - 59	30	1.1	35	1.3
60 - 64	25	0.9	25	0.9
65 and over	55	2.0	65	2.3

Source: 1976 Census of Canada, Enumeration Area Tabulations.

Table 3.31 Age and Sex Composition by Five Year Age Groups, Municipal District 87, Rural Portion: 1961.

Age Group	Males		Females	
	#	%	#	%
All Ages	3,983	55.1	3,244	44.9
0 - 4	523	7.2	456	6.3
5 - 9	527	7.3	478	6.6
10 - 14	464	6.4	452	6.2
15 - 19	406	5.6	329	4.6
20 - 24	247	3.4	174	2.4
25 - 29	220	3.0	170	2.3
30 - 34	210	2.9	158	2.2
35 - 39	211	2.9	192	2.7
40 - 44	216	3.0	200	2.8
45 - 49	192	2.7	167	2.3
50 - 54	172	2.4	142	2.0
55 - 59	187	2.6	99	1.4
60 - 64	143	2.0	75	1.0
65 and over	265	3.7	152	2.1

Source: 1961 Census of Canada, Enumeration Area Tabulations.

Table 3.32 Age and Sex Composition by Five Year Age Groups, Municipal District 87, Rural Portion: 1966.

Age Group	Males		Females	
	#	%	#	%
All Ages	3,470	52.7	3,119	47.3
0 - 4	419	6.4	448	6.8
5 - 9	463	7.0	432	6.5
10 - 14	463	7.0	454	6.9
15 - 19	352	5.3	330	5.0
20 - 24	172	2.6	169	2.6
25 - 29	154	2.3	142	2.1
30 - 34	187	2.8	165	2.5
35 - 39	182	2.8	146	2.2
40 - 44	188	2.9	183	2.8
45 - 49	169	2.6	169	2.6
50 - 54	164	2.5	128	1.9
55 - 59	143	2.2	116	1.8
60 - 64	146	2.2	76	1.2
65 and over	268	4.1	161	2.4

Source: _1966 Census of Canada_, Enumeration Area Tabulations.

Table 3.33 Age and Sex Composition by Five Year Age Groups, Municipal District 87, Rural Portion: 1971.

Age Group	Males		Females	
	#	%	#	%
All Ages	3,325	54.6	2,760	45.4
0 - 4	325	5.3	290	4.8
5 - 9	440	7.1	405	6.6
10 - 14	495	8.0	385	6.3
15 - 19	390	6.4	285	4.7
20 - 24	160	2.6	125	2.1
25 - 29	145	2.4	150	2.5
30 - 34	160	2.6	160	2.6
35 - 39	200	3.3	180	3.0
40 - 44	170	2.8	145	2.4
45 - 49	185	3.0	160	2.6
50 - 54	155	2.5	135	2.2
55 - 59	135	2.2	100	1.6
60 - 64	120	2.0	90	1.5
65 and over	245	4.0	150	2.5

Source: 1971 Census of Canada, Enumeration Area Tabulations.

Table 3.34 Age and Sex Composition by Five Year Age Groups, Municipal District 87, Rural Portion: 1976.

Age Group	Males		Females	
	#	%	#	%
All Ages	3,170	53.5	2,755	46.5
0 - 4	265	4.5	255	4.3
5 - 9	350	5.9	300	5.1
10 - 14	475	7.9	420	7.2
15 - 19	375	6.3	340	5.7
20 - 24	190	3.2	150	2.5
25 - 29	160	2.7	160	2.7
30 - 34	165	2.8	170	2.9
35 - 39	200	3.4	150	2.5
40 - 44	205	3.5	165	2.8
45 - 49	165	2.8	140	2.4
50 - 54	175	3.0	150	2.5
55 - 59	130	2.2	120	2.0
60 - 64	100	1.7	90	1.5
65 and over	2.5	3.6	145	2.4

Source: *1976 Census of Canada*, Enumeration Area Tabulations.

Table 4.4 Length of Residence: Multiple Regression Results

Variable[1]	B	Std.Error	F	Beta	r
Age	0.564	0.034	278.7	.490	.639
Grew up in Alberta	4.876	1.317	13.7	.123	.281
Yrs. in place where grew up	0.206	0.035	35.5	.159	.543
Rural farm	5.285	1.217	18.9	.108	.248
Yrs. Education	-0.629	0.131	22.9	-.120	-.464
Alberta born	4.982	1.131	14.5	.126	.228
Household size	-1.092	0.281	15.0	-.089	-.171
Roman Catholic	3.051	0.867	12.4	.075	.108
Size of place where grew up	-2.837	0.914	9.6	-.077	-.284
Single family dwelling	2.215	1.056	4.4	.047	.228
Constant	-3.291	R^2=.601	F=135.1	P=.001	

[1] The equation is in reduced form to include only those variables with significant effects at the .05 level. Variables are listed in the order in which they were entered into the equation, and listwise deleation of was used.

Table 5.1 Labour Force Participation[1] by Locale and Sex of Respondent

Locale Sex of Respondent	Percent Employed Full-time	N
Cold Lake		
Male	79.0	69
Female	30.1	89
TOTAL	51.5	158
Grand Centre		
Male	88.2	95
Female	44.0	111
TOTAL	64.4	206
Bonnyville		
Male	58.8	108
Female	30.3	172
TOTAL	41.2	280
Rural farm		
Male	86.4	83
Female	19.8	108
TOTAL	48.7	191
Rural non-farm		
Male	39.1	50
Female	24.2	55
TOTAL	31.3	105
All locations		
Male	72.5	405
Female	30.4	535
TOTAL	48.5	940

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[1] Reported full-time employment at time of interview

Table 5.3 Occupation by Sex: Cold Lake Study Area, Fort McMurray and Edmonton 1979 Survey Estimates

	Cold Lake Study Area		Fort McMurray[1]		Edmonton[2]	
	Male	Female	Male	Female	Male	Female
	Percentages					
Managerial, administrative	5.8	2.5	5.2	2.7	13.2	3.8
Professional, technical	11.5	27.4	19.6	22.4	21.4	32.2
Clerical, sales service	27.2	59.8	11.8	61.4	23.0	58.9
Farming, fishing forestry, mining	22.4	5.5	3.1	0.0	1.4	0.0
Crafts, production, processing, construction	26.8	3.1	51.3	4.5	25.0	3.7
Transport, communications	3.1	0.6	4.2	3.6	10.5	0.7
Materials handling (labour)	0.3	0.6	3.1	1.8	3.9	0.7
Occupations NOC	3.4	0.6	2.1	2.7	1.3	0.0
TOTAL	100.5	100.1	100.4	99.1	99.7	100.0
N	293	164	193	112	152	129

[1] Source: Gartrell et al, 1980

[2] Source: Edmonton Area Study 1979, Population Research Laboratory, University of Alberta.

Table 5.4 Type and Size of Farm and Gross 1978 Income from Farming in the Cold Lake Study Area: Survey Estimates

	Percent	N
Type of farm		
Mixed	54	118
Grain	21	45
Beef	17	36
Other (including dairy)	8	18
TOTAL	100	217
Acres owned		
≤160	27	58
161-320	22	47
321-480	16	34
481-640	10	22
≥640	25	54
TOTAL	100	215
Gross 1978 Income from farming ($)[1]		
≤2000	27	39
2001-10000	28	41
10001-20000	15	22
20001-50000	19	28
≥50000	11	16
TOTAL	100	146

[1] Of the 217 respondents who reported that someone in their household had been involved in farming in the previous year, 71 (33%) did not answer this question.

Table 5.6 Fringe Benefits by Employer

Benefit	Total Labour Force[1]	Employer (for non-farmers only)[2]		
		DND[3]	Govt./Schools	Other
	Percent Receiving Benefit			
Pension plan	44	95	78	26
Training program	37	63	39	37
Life insurance	37	85	58	23
Transportation	33	63	19	34
Free/discounted merchandise	31	59	7	36
Supplementary medical	31	24	75	29
Meals	26	63	18	22
Dental plan	26	59	18	23
Moving expenses	21	58	14	15
Recreation facilities	20	74	20	5
Stock options/ profit sharing	11	0	2	20
Cost of living allowance	7	5	8	10
Housing subsidy	2	0	1	3
Utilities subsidy	2	0	0	3

---

[1] Total sample sizes ranged from 434 to 438 for these items.

[2] Farmers excluded since they do not receive fringe benefits (in the formal sense). Sample sizes are: DND (87); Government (all levels) and schools (64); other employers (223).

[3] 49 of the 87 respondents employed by the Department of National Defense were actually military personnel. The remainder are employed in other capacities.

Table 5.7 Household Possession[1] and Investment[2] Scales by Locale, Respondents' Age, Marital Status and Education, and Total 1978 Household Income

	Household Possessions	Investments	
Locale	Averages		N
Cold Lake	4.36	1.78	157
Grand Centre	4.70	1.86	205
Bonnyville	4.15	1.32	278
Rural farm	4.84	1.38	190
Rural non-farm	3.92	1.00	105
Age of Respondent (years)			
≤21	3.08	0.94	66
22-25	4.05	1.34	102
26-30	4.22	1.56	106
31-35	5.17	1.78	111
36-40	5.61	2.11	86
41-45	5.61	1.78	91
46-55	4.94	1.71	146
56-65	4.27	1.24	102
≥66	2.76	0.84	123
Marital Status			
No spouse	2.80	1.31	213
Spouse present	4.90	1.55	722
Respondents' Education (years)			
0-6	3.07	0.73	116
7-9	4.09	1.08	230
10-11	4.62	1.58	192
12	4.86	1.68	179
13-16	5.19	1.97	173
≥17	3.99	2.67	43
Total 1978 Household Income ($)			
≤4999	2.62	0.58	83
8000-9999	3.34	0.93	125
10000-14999	4.37	1.48	117
15000-19999	4.96	1.51	113
20000-24999	5.11	1.87	115
25000-29999	5.40	2.04	58
≥30000	5.49	2.60	104

---

[1] Household possession scale score equals the total number owned of the nine possible possessions listed in Fig. 6.3.

[2] Investment scale score equals the total owned of the seven possible investments listed in Figure 6.3.

Table 6.2 Perceptions of Housing Supply Problems[1] by Locale, House Type and Length of Residence in Study Area

	Averages (x/100)
Locale	
Cold Lake (148)[2]	61.3
Grand Centre (202)	60.3
Bonnyville (272)	50.9
Rural farm (172)	43.0
Rural non-farm (104)	53.4
House type	
Single detached (693)	50.9
Multiple family dwelling[3] (111)	65.4
Mobile home (94)	58.7
Length of residence in study area (years)	
≤ 1.0 (91)	61.0
1.1 - 2.0 (54)	59.2
2.1 - 3.0 (53)	62.9
3.1 - 5.0 (84)	59.0
5.1 - 10.0 (124)	52.7
10.1 - 20.0 (115)	55.6
20.1 - 35.0 (158)	50.5
35.1 - 50.0 (117)	40.0
≥50.1 (96)	52.1

---

[1] Respondents were asked to respond, using a "Strongly disagree (1) - (7) Strongly agree" scale, to the statement "It is hard to get the kind of housing you really want." Scores were transformed into a scale ranging from zero to one hundred. Higher scores represent less satisfaction with housing supply.

[2] Sub-sample sizes given in brackets.

[3] Multiple family dwellings include all types (e.g., apartments, duplexes, basement suites, etc.) other than single detached dwellings and mobile homes.

Table 6.3 Estimated Housing Value and Shelter Costs for Owners by Community and House Type

Community	Estimated home value ($1000's)		Monthly mortgage payment ($)		Last year's taxes ($)	
House Type	Averages					
Cold Lake						
Single	96	(70)[1]	219	(79)	601	(69)
Multiple	65	(2)	295	(2)	550	(2)
Mobile	42	(5)	180	(5)	409	(5)
TOTAL	91	(77)	219	(86)	587	(76)
Grand Centre						
Single	79	(104)	215	(106)	660	(99)
Multiple	—	(0)	—	(0)	—	(0)
Mobile	24	(28)	184	(30)	249	(20)
TOTAL	68	(132)	209	(136)	589	(119)
Bonnyville						
Single	82	(139)	164	(158)	562	(149)
Multiple	50	(5)	332	(5)	341	(3)
Mobile	29	(28)	240	(28)	175	(17)
TOTAL	72	(172)	179	(191)	518	(169)
All three communities						
Single	84	(313)	192	(343)	600	(317)
Multiple	56	(7)	327	(7)	321	(5)
Mobile	28	(61)	208	(63)	208	(42)
TOTAL	73	(381)	197	(413)	557	(364)

---

[1] Sub-sample sizes given in brackets

Table 6.4 Monthly Rent by Community and House Type

Community House Type	Average Monthly Rent ($)	N
Cold Lake		
Single	276	33
Multiple	292	28
Mobile	168	2
TOTAL	278	63
Grand Centre		
Single	235	30
Multiple	312	23
Mobile	236	7
TOTAL	265	60
Bonnyville		
Single	259	25
Multiple	228	41
Mobile	350	2
TOTAL	242	68
All three communities		
Single	256	88
Multiple	270	92
Mobile	240	11
TOTAL	262	191

Table 6.6 Housing Characteristics by Locale

Locale	No. of finished rooms	No. of Bedrooms	No. of Bathrooms	Household members per room	N
			Averages		
Cold Lake	5.8	2.7	1.5	0.53	158
Grand Centre	6.3	3.1	1.4	0.51	206
Bonnyville	5.5	2.8	1.4	0.56	280
Rural farm	6.8	3.3	1.3	0.59	191
Rural non-farm	5.4	2.6	1.0	0.64	105
Total	6.0	2.9	1.3	0.56	940

Table 6.8 Housing Evaluations[2] by House Type

Housing Characteristic	Single Detached	Multiple Family[2]	Mobile Home
	Averages (x/100)		
Parking	84.7	71.6	66.0
Exterior space	87.3	58.5	58.4
Privacy	80.9	56.1	60.7
Storage	75.5	72.9	50.6
Exterior condition	72.6	66.5	74.5
Interior condition	70.8	71.8	76.8
Insulation	72.4	67.4	68.5
Play space for children	78.4	35.3	52.4
Interior space	71.7	70.9	62.4
Noise level	70.5	59.7	56.5
Room design	63.1	62.3	69.6
Maintenance cost	60.6	59.9	58.8
Taxes	55.9	43.6	54.9
Landscaping	58.6	50.7	33.2

[1] Original seven-point ("very poor" to "very good") scale transformed into a zero to one hundred scale. For sample sizes see notes 2 and 3 in Table 6.7.

[2] "Multiple family" is comprised of duplexes, apartments, basement suites, and "other" housing types.

Table 7.1 Reported Service Use in the Past Year by Locale

Service	Cold Lake	Grand Centre	Bonny-ville	Rural farm	Rural non-farm	Total
	Percent					
Used hospital services	60.0	56.9	54.0	53.8	62.7	56.4
Used utility maintenance	36.2	42.6	36.7	49.4	39.6	40.8
Used public health	26.9	36.6	31.6	34.0	32.5	32.5
Called police	33.9	33.7	29.9	24.7	39.1	31.4
Used public library	21.5	29.2	23.7	13.6	12.3	21.2
Used ambulance	6.9	5.0	8.5	10.7	6.2	7.6
Used counselling services	3.9	5.0	6.3	7.1	5.1	5.6
Used day care services [1]	2.2	11.3	3.0	1.3	2.2	4.1
Called fire department	4.6	4.5	1.7	4.7	5.0	3.8
N	158	206	280	191	105	940

[1] Answered only by 369 respondents with children. Locale N's are: Cold Lake (55); Grand Centre (72); Bonnyville (104); Rural farm (84); Rural non-farm (46).

Table 7.3 Perceptions of Community Safety by Locale

A. "How safe do you feel walking alone in your neighbourhood at night?"

Locale	Very unsafe	Somewhat safe	Reasonably safe	Very safe	N
	Percent				
Cold Lake	7.0	10.1	45.7	37.2	157
Grand Centre	4.0	11.0	43.0	42.0	204
Bonnyville	6.9	17.2	43.1	32.8	275
Rural farm	3.0	4.7	28.4	64.0	190
Rural non-farm	5.1	11.4	38.8	44.7	105
TOTAL	5.3	11.4	40.0	43.3	931

B. "When you (or other family members) are at home, do you keep your doors locked?"

Locale	Never	Seldom	Sometimes	Often	Very often	N
	Percent					
Cold Lake	26.2	13.1	17.7	18.5	24.6	158
Grand Centre	26.2	12.9	22.8	13.4	24.8	206
Bonnyville	18.6	7.9	28.2	18.1	27.1	280
Rural farm	53.4	8.8	22.4	7.1	8.3	191
Rural non-farm	43.2	11.8	24.8	5.1	15.0	105
TOTAL	31.4	10.5	23.7	13.4	21.0	940

C. "When you leave home even for a short time, do you keep your doors locked?"

Cold Lake	10.8	8.5	8.5	10.0	62.3	158
Grand Centre	10.4	8.9	13.4	11.4	55.9	206
Bonnyville	8.5	9.0	6.8	11.3	64.4	280
Rural farm	40.5	10.0	13.0	7.7	28.9	191
Rural non-farm	23.6	15.3	11.1	10.2	39.9	105
TOTAL	17.5	9.8	10.2	10.2	52.2	940

Table 7.5 Evaluation[1] of Community Services by Use of Services

Service	Used in last twelve months		
	YES		NO
	Averages (X/100)		
Utility maintenance	75.3	*	69.0
Public health	75.7	*	67.0
Ambulance	74.5		68.3
Police protection	58.0	*	67.2
Fire protection	59.2		64.0
Public library	63.3		59.8
Hospital	55.3		54.8
Counselling services	62.7	*	50.3
Day care	24.7		17.0

[1] Original seven point ("very poor" to "very good") scale transformed into a zero to one hundred scale.

*Differences are statistically significant ($p < .01$)

Table 8.1 Non-work activities in Past Four Weeks by Locale

Activity	Cold Lake	Grand Centre	Bonnyville	Rural farm	Rural non-farm	Total
	Averages					
Attend church	1.19	0.87	3.07	2.16	0.91	1.85
Club or organization meetings	1.30	1.40	1.01	0.93	0.65	1.09
Entertain at home	3.58	3.52	3.73	3.22	4.09	3.59
Eat out in a restaurant	3.94	3.14	2.66	2.01	2.93	2.88
Go to a bar or lounge	2.79	2.65	1.24	0.72	1.37	1.72
Go to the movies	0.68	0.62	0.32	0.10	0.24	0.39
Attend cultural activities	0.07	0.05	0.25	0.24	0.07	0.16
N	158	206	280	191	105	940

Table 8.2 Non-work Activities in Past Four Weeks by Age and Education of Respondent

Respondent Characteristic	Activity				
	Attend church	Club/org. meeting	Restaurant	Bar or lounge	Attend movies
Respondents' age	Averages				
≤ 21 (66)[1]	0.80	0.45	4.27	4.55	1.42
22 - 25 (102)	0.80	0.70	3.11	3.00	0.77
26 - 30 (107)	1.42	1.46	3.19	2.28	0.68
31 - 35 (111)	1.19	1.26	5.05	1.70	0.53
36 - 40 (85)	1.31	1.61	3.86	1.46	0.17
41 - 45 (92)	1.79	1.78	1.76	1.14	0.19
46 - 55 (148)	2.34	1.19	2.84	1.39	0.15
56 - 65 (102)	2.05	0.82	1.49	0.67	0.08
≥ 66 (123)	3.90	0.51	1.08	0.50	0.01
Respondents' education (years)					
≤ 6 (117)	3.94	0.37	1.18	0.78	0.17
7 - 9 (232)	1.80	0.56	1.99	1.10	0.26
10 - 11 (191)	1.37	1.10	2.67	1.94	0.44
12 (180)	1.08	1.06	3.13	1.79	0.53
13 - 16 (172)	1.83	1.80	4.87	2.66	0.56
≥ 17 (43)	1.82	3.09	4.13	2.53	0.26
Total (936)	1.85	1.09	2.88	1.72	0.39

[1] Sub-sample sizes given in brackets.

Table 8.3 Patterns of Non-work Activity in Past Four Weeks

Activity	(2)	(3)	(4)	(5)	(6)	(7)
	Zero-order correlation coefficients[1]					
1. Attend church	.214	.078	-.074	-.137	-.105	.043
2. Club/organization meetings		.016	.092	.013	.031	.073
3. Entertain at home			.122	.095	.161	.075
4. Eat out in a restaurant				.281	.196	.084
5. Go to a bar or lounge					.266	.085
6. Go to the movies						.151
7. Attend cultural activities						

---

[1] Correlation coefficients calculated from samples ranging in size (because of missing data) from 930 to 938. Coefficients larger than 0.08 are statistically significant ($p < .01$).

Table 8.4 Frequency of Recreational Activities by Locale

Activity	Cold Lake	Grand Centre	Bonny-ville	Rural farm	Rural non-farm	Total
Play team sports						
Frequency			Percent			
Never	50.8	53.0	67.2	65.3	73.6	61.7
Seldom	19.2	14.9	14.1	15.8	7.2	14.7
Sometimes	10.0	14.4	8.5	12.4	6.1	10.5
Often	15.4	12.9	7.9	4.7	9.1	9.7
Very Often	4.6	5.0	2.3	1.8	4.1	3.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Play non-team sports						
Never	48.5	38.6	63.1	63.6	63.4	55.4
Seldom	17.7	18.8	14.8	10.5	8.4	14.6
Sometimes	23.8	19.3	14.8	18.8	16.1	18.3
Often	6.2	15.3	6.8	6.5	9.9	8.9
Very Often	3.8	7.9	0.6	0.6	2.2	2.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
Exercise for the sake of exercise						
Never	22.3	24.8	31.3	38.9	28.0	29.5
Seldom	16.9	22.3	13.0	15.9	20.9	17.2
Sometimes	34.6	25.7	29.9	24.7	25.2	28.2
Often	11.5	14.4	18.1	11.8	21.1	15.2
Very Often	14.6	12.9	7.9	8.8	4.8	10.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
N	158	206	280	191	105	940

Table 8.5 Correlates of Recreational Activity:[1] Three Multiple Regression Equations[2]

Independent Variable	B	Beta	St. error B	F	r
A. Frequency of playing team sports					
Age	-.201	-.295	.003	52.7	-.385
Education	.065	.207	.013	26.7	.363
Sex (male = 1)	.287	.119	.083	12.1	.067
(Constant)	1.892				
$R^2 = .197$		$F = 57.8$		$p < .0001$	
B. Frequency of playing non-team sports					
Education	.079	.255	.013	39.1	.363
Sex (male = 1)	.484	.203	.080	36.6	.067
Age	-.012	-.174	.003	18.4	-.385
1978 hh. income	.014	.133	.004	12.6	.226
(Constant)	1.198				
$R^2 = .238$		$F = 55.3$		$p < .0001$	
C. Frequency of exercise just for the sake of exercise					
Sex (male = 1)	-.288	-.109	.098	8.7	.067
Education	.032	.093	.013	6.3	.363
(Constant)	2.418				
$R^2 = .021$		$F = 7.6$		$p < .001$	

---

[1] Dependent variables coded: Never = 1; Seldom = 2; Sometimes = 3; Often = 4; Very often = 5.

[2] Age, education, sex of respondent (male = 1; female = 0), 1978 total household income ($1000's) and length of residence in the study area were included as potential predictors in each multiple regression analysis. Reduced form equations (the addition of further independent variables failed to significantly increase the amount of explained variance) are presented in each case. The sample size was reduced to 712 because of missing data on the income variable.

Table 8.6 Frequency of Recreational Activities[1] by Age, Education and Sex of Respondent.

Respondent Characteristic	Activity		
	Team Sports	Non-team Sports	Exercise
Respondents' age	Averages		
≤ 21 (66)[2]	2.23	2.25	3.13
22 - 25 (102)	2.43	2.37	3.10
26 - 30 (108)	2.15	2.34	2.85
31 - 35 (111)	2.15	2.10	2.60
36 - 40 (86)	1.93	2.14	2.24
41 - 45 (92)	1.66	1.72	2.13
46 - 55 (148)	1.54	1.66	2.35
56 - 65 (102)	1.17	1.49	2.50
≥ 66 (123)	1.15	1.30	2.62
Respondents' education (years)			
≤ 6 (117)	1.08	1.17	2.46
7 - 9 (232)	1.37	1.46	2.32
10 - 11 (192)	1.86	1.89	2.65
12 (180)	2.18	2.24	2.74
13 - 16 (173)	2.14	2.28	2.77
≥ 17 (43)	2.68	3.24	2.91
Sex of respondent			
Male (404)	1.91	2.15	2.47
Female (535)	1.69	1.70	2.69
Total (940)	1.78	1.89	2.59

---

[1] Coded: Never = 1; Seldom = 2; Sometimes = 3; Often = 4; Very often = 5.

[2] Sub-sample sizes given in brackets.

Table 9.1 Distribution of Marital Status by Locale[1]

Locale	Marital Status						
	Never Married	Married	Common Law	Seper- ated	Div- orced	Wid- owed	Total N
	Percent						
Cold Lake	12.3	68.5	7.7	1.5	3.1	6.9	158
Grand Centre	15.3	65.8	10.4	3.5	1.5	3.5	206
Bonnyville	10.7	67.2	2.8	4.5	4.0	10.7	280
Rural Farm	7.0	86.5	0.6	1.8	0.6	3.6	191
Rural Non-farm	6.1	76.7	6.3	3.0	2.0	5.8	105
Cold Lake Region	10.7	72.1	5.2	3.1	2.4	6.5	940
Fort McMurray[2]	17.7	66.7	8.6	1.6	4.0	1.4	430
Edmonton[3]	21.4	58.0	3.6	4.5	5.9	6.6	440

[1] The table is head as "12.3% of the 158 respondents surveyed in the town of Cold Lake reported being never married".

[2] AOSERP 1979 (Gartrell et al., 1980).

[3] EAS 1979, Population Research Laboratory, Dept. of Sociology, University of Alberta, Edmonton.

Table 9.2 Household Size and Number of Children by Locale

Locale	Household Size	Live-born Children	Children in Household	N[1]
		Averages		
Cold Lake	2.98	2.66	0.96	158
Grand Centre	3.12	2.28	1.07	206
Bonnyville	2.91	2.63	0.99	280
Rural Farm	3.82	3.59	1.51	191
Rural Non-farm	3.27	3.07	1.18	105
Total	3.20	2.80	1.13	940
η^2	0.044	0.035	0.022	

[1] Sample sizes vary slightly for different indicators due to missing data. All differences between locales are significant at the .001 level

Table 9.3 Marital Status Differences for Selected Indicators[1]

			Marital Status				
Indicator	Never Married	Married	Common Law	Seperated	Divorced	Widowed	2
			Averages				
Yrs. res. in area	15.8	21.0	9.1	16.6	19.8	36.3	.068
Household possessions	3.1	5.9	3.8	4.4	4.4	3.4	.179
Stress Index	2.8	1.9	4.1	2.7	4.2	1.4	.128
Single Dwelling[2]	0.62	0.84	0.54	0.63	0.50	0.64	.069
No. of children	0.1	3.1	1.3	2.1	2.5	4.8	.189
Household size	1.8	3.6	3.0	2.1	2.4	1.6	.208
N	101	678	49	22	29	61	

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[1] Sample sizes differ slightly for different indicators due to missing data. Eta-sqared, η^2, gives the proportion of variance in each indicator which can be accounted for by the differences between marital statuses. Differences are significant at the .001 level for all indicators.

[2] Since this indicator is coded as a binary variable, averages are read as proportions having single family dwellings.

Table 9.5 Interaction with Spouse and Relatives

Get out together with spouse

Response Category	Percent[1]	
Never	3	(3)
Seldom	20	(22)
Sometimes	32	(35)
Often	32	(28)
Very Often	12	(12)

Relatives

Response Category	Visit in area	Contact outside area
	Percent	
Never[2]	30	1
Almost Never	2	3
- 1/mo.	4	12
1/mo.	7	24
1-3/mo.	14	30
1/wk.	18	20
1-3/wk.	13	7
Almost Daily	6	3
Daily	7	1

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[1] Percentages in parentheses refer to results from the 1979 AOSERP survey of Fort McMurray (Gartrell et al, 1980).

[2] For visiting within the Cold Lake area, the never category includes those who indicated that they had no relatives living within the area (and presumably were never visited by those living outside the area).

Table 9.6 Visiting Relatives by Locale

Locale	N	Visit relatives in the region	Contact relatives outside the region
		Averages	
Cold Lake	120	3.33	3.98
Grand Centre	137	2.36	3.88
Bonnyville	196	3.60	3.65
Rural farm	166	4.04	3.75
Rural non-farm	87	4.02	4.08
Total	727	3.44	3.83
η^2		.053	.011
Significance Level		.001	.100

Table 9.7 Actual and Expected Parity by Locale

Locale	N	Actual parity	N	Expected parity
		Averages		
Cold Lake	66	1.96	61	2.74
Grand Centre	80	2.24	80	2.51
Bonnyville	103	2.15	100	2.97
Rural farm	90	3.05	90	3.48
Rural non-farm	40	2.27	39	2.87
Total	378	2.37	369	2.95
η^2		.064		.072
Significance level		.001		.001

Table 9.9 Determinants of Parity: Multiple Regression Results for Once Married Women under 46.

Variable[1]	B	Std.Error	F	r
1. Yrs. Married	.115	.023	25.41	.610
2. Wife's LFP (work=1)	-.445	.129	11.83	-.129
3. French ethnic status (father)	.416	.165	6.34	.069
4. Wife's yrs. education	-.074	.032	5.52	-.069
5. Household possessions	-.026	.033	.60	.052
6. Wife's age	.014	.021	.46	.540
7. Grand Centre	-.307	.188	2.65	-.047
8. Cold Lake	-.259	.208	1.56	-.138
9. Rural non-farm	-.138	.232	.36	-.015
10. Bonnyville	-.085	.181	.22	-.070
Constant 1.970		N=366	R^2=.437	F=27.62

[1] Wife's labour force participation (LFP), ethnic status, and the variables representing the different locales within the study area were all coded as binary variables. The binary variable, Roman Catholic, could not be entered into the equation. Its 10th order partial correlation with parity was .0009. Years married and wife's age were colinear (r=.906). The entry of the latter variable into the equation more than doubled the standard error for years married, but had little effect on its partial regression coefficient (B).

Table 9.12 Selected Indicators by Marital Status: Satisfaction and Attitudes Towards the Region

Indicator	Marital Status[1] Never Married	Married	Common -Law	Divorced	Seperated	Widowed
	Average					
Raise a family	70.6	78.2	68.5	54.3	65.3	72.7
Family breakdown common	64.0	49.3	57.3	66.5	80.0	51.7
Marital infidelity common	58.3	44.9	53.6	68.5	71.4	48.5
Establish permanent home	73.1	80.0	71.2	68.6	59.7	87.5
Satisfaction with family life	82.5	88.4	83.4	62.6	62.6	82.4

[1] Differences between marital status categories are signficant at the .001 level for all indicators.

Table 10.2 Associational Affiliation and Participation by Locale

Locale	No. of Org. Memb.	No. of meetings /4 wks.	Church Attend. / 4 wks.	Hrs. vol. work / 4 wks.	N
	Averages				
Cold Lake	1.25	1.30	1.18	7.18	158
Grand Centre	1.35	1.40	0.87	4.22	206
Bonnyville	0.99	1.01	3.07	5.49	280
Rural farm	1.41	0.93	2.16	5.63	191
Rural non-farm	0.80	0.65	0.91	3.39	105
η^2	.021	.008	.054	.004	
Sig. Level	.001	.105	.001	.467	

Table 10.3 Age and Formal Participation

Age	No. of Org. Memb.	No. of Meetings /4 wks.	Church attend. /4 wks.	Hrs. vol. work /4 wks.	N[1]
	Average				
Below 25	0.58	0.60	0.78	1.80	140
25-35	1.24	1.29	1.21	4.14	227
35-45	1.45	1.44	1.49	5.06	176
45-55	1.42	1.38	2.41	8.27	152
55-65	1.36	1.04	1.79	7.70	106
65 and over	0.93	0.52	3.83	5.90	139
Total	1.18	1.09	1.85	5.29	940
η^2	.042	.019	.058	.013	
Sig. Level	.001	.005	.001	.050	

[1] Sub-sample sizes vary slightly across indicators.

Table 10.4 Length of Residence and Formal Participation

Years Resident	No. of Org. Memb.	No. of Meetings /4 wks.	Church attend. /4 wks.	Hrs. vol. work /4 wks.	N
	Average				
0-1	0.82	0.77	1.29	2.30	93
1-2	1.22	1.30	1.06	2.14	54
2-3	1.03	1.78	1.38	3.80	56
3-5	0.94	1.35	2.07	8.33	85
5-10	1.28	0.97	1.34	3.36	128
10-20	1.67	1.99	1.59	7.20	122
20-35	1.18	0.87	1.52	5.29	168
35-50	1.23	0.76	2.34	5.45	127
50-76[1]	0.99	0.51	3.80	8.12	101
Total	1.45	1.09	1.86	5.31	935
η^2	.026	.031	.037	.013	
Sig. level	.002	.001	.001	.158	

[1] Years resident in the region ranged from less than one month to 76 years.

Table 10.5 Correlates of Formal Participation

Indicator	No. of Org. Memb.	No. of meetings /4 wks.	Church attend. /4 wks.	Hrs. vol. work /4 wks.
	Zero-order Correlations[1]			
Sex (M=1)	.138	.057	-.042	.023
Married	.076	.087	-.037	.054
Education	.258	.223	-.133	.011
Employed	.142	.094	-.140	-.046
Household possessions	.254	.198	-.030	.073
Employed by DND	.093	.024	-.092	-.043
Single house	.065	.059	-.052	-.016
Roman Catholic	.036	-.023	.238	.035
French	.001	.013	.245	.047
Own home	.135	.060	.000	.041
Income of household	-.000	.011	-.243	.009

[1] Zero-order correlations of r=.076 or higher are sigificant at the .01 level. Correlations of r=.133 or higher are significant at the .001 level. Sample sizes vary slightly due to missing data, except in the case of household income, where reduction in sample size is fairly large (as much as approximately 20%).

Table 10.7 Interaction with Neighbours: Place Comparisons

Get together with neighbours for a chat	Cold Lake Region	Fort McMurray	Edmonton
	Percent		
Never[1]	10	21	22
Less than once a month	16	21	27
1-3 times per month	25	27	22
1-3 times per month	36	28	21
Daily	14	4	8
Total	101	100	101
Average	2.26	1.73	1.64
St. Dev.	1.18	1.19	1.25

[1] Response categories were collapsed to fit those used in the 1979 EAS.

Table 10.8 Neighbourhood Networks by Locale

Locale	N	Know neighbours	Chat with neighbours
		Average	
Cold Lake	158	3.15	4.36
Grand Centre	206	2.72	3.88
Bonnyville	280	3.20	4.14
Rural farm	191	5.16	4.13
Rural non-farm	105	4.36	3.95
Total	940	3.62	4.10
η^2		.244	.005
Sig. level		.001	.332

Table 10.9 The Development of Neighbourhood Ties by Broad Migration Cohorts by Locale

	Yrs. resident				
Locale	0-3	3-10	10-35	35-76	Total
	Average neighbours known (N)				
Cold Lake	2.21 (52)	2.50 (34)	4.14 (51)	4.25 (19)	3.15 (157)
Grand Centre	1.78 (50)	2.92 (73)	3.07 (68)	3.42 (12)	2.72 (204)
Bonnyville	1.95 (66)	2.86 (58)	3.81 (68)	3.98 (85)	3.20 (278)
Rural farm	4.10 (11)	5.26 (30)	5.22 (71)	5.23 (79)	5.16 (191)
Rural non-farm	2.60 (23)	4.51 (17)	4.85 (32)	5.06 (33)	4.36 (105)

Table 10.10 Neighbours Known:Multiple Regression Results[1]

Variable	B	St.Error	F	Beta	r
Rural farm	1.4361	.1326	117.30	.3199	.4302
Yrs. resident	.0223	.0028	63.20	.2401	.4043
Rural non-farm	1.0726	.1602	44.84	.1873	.1464
Own home	.5499	.1298	17.95	.1332	.3329
Single house	.3173	.1293	6.02	.0727	.2970
No. of kids	.0542	.0212	6.56	.0732	.2753
Possessions	.0598	.0221	6.63	.0788	.1361
Grand Centre	-.3225	.1257	6.58	-.0739	-.2713
Constant	1.725				

R^2= .379 F=68.87 Sig. level = .001

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[1] N=912. The reduced form equation presented used listwise deleation and variables are listed in the order in which they were entered into the equation. All predictors are significant at the .001 level.

Table 10.11 Visiting with Friends: Levels of Interaction in Networks

Categories[1]	Cold Lake region	Edmonton	Fort McMurray
	Percent		
Never or rarely	4	9	4
Less than once a month	10	46	12
1-3 times per month	31	32	50
1-3 times per week	38	12	21
Almost daily or more	8	2	13
N	940	438	429
Average	2.18	1.54	2.27
St. Dev.	1.13	0.88	0.94

[1] For the Cold Lake sample, these results combine codes of 1 and 2, 3 and 4, 5 and 6, and 7 and 8. For the Fort Mcmurray data, it combines codes 1 and 2, 3 and 4, and 6 and 7.